

# **ENVIRONMENTAL** *Guidelines*

**GUIDELINES FOR ENVIRONMENTAL MANAGEMENT OF DEVELOPMENT IN MONTGOMERY COUNTY**

**NATURAL RESOURCES INVENTORY • STREAMS AND  
FLOODPLAINS • STREAM BUFFERS • WETLANDS • STEEP  
SLOPES • UNSAFE AND UNSUITABLE LAND • THREAT-  
ENED AND ENDANGERED SPECIES AND SPECIES IN  
NEED OF CONSERVATION • ENVIRONMENTALLY SENSI-  
TIVE OR SPECIAL PROTECTION AREAS • AGREEMENTS  
AND CONSERVATION EASEMENTS • PATUXENT WATER-  
SHED PRIMARY MANAGEMENT AREA •**



**The Maryland-National Capital Park & Planning Commission  
MONTGOMERY COUNTY PLANNING DEPARTMENT  
8787 Georgia Avenue, Silver Spring, Maryland, 20910-3760**

**APPROVED BY THE MONTGOMERY COUNTY  
PLANNING BOARD**

**JANUARY 1993**

**CORRECTED: JUNE 1994**

## TABLE OF CONTENTS

	<u>Page</u>
I. Purpose .....	1
II. Introduction .....	3
III. Natural Resources Inventory .....	5
A. Streams and Floodplains	
B. Stream Buffers	
C. Topography	
D. Highly Erodible Soils	
E. Wetlands	
F. Forest and Trees	
G. Unsafe and Unsuitable Land	
H. Danger Reach/Dam Break Analysis	
I. Threatened and Endangered Species and Species in Need of Conservation	
IV. Guidelines for Development .....	14
A. Stream Valley Protection	
B. Wetland and Floodplain Protection	
C. Forest and Tree Conservation	
D. Unsafe and Unsuitable Land Protection	
E. Danger Reach	
F. Protection of Rare, Threatened and Endangered Species; Species in Need of Conservation and Watchlist Species	
V. Environmentally Sensitive and Special Protection Areas .....	22
VI. Implementation .....	26
A. Development Agreements	
B. Conservation Easements	
C. Waivers to Base Zone Standards and Specifications for Environmental Reasons	
D. Exceptions to the Guidelines	
VII. The Patuxent Watershed Primary Management Area (PMA).....	32
A. Background and Purpose	
B. Introduction: The Patuxent River	
C. The Patuxent River Policy Plan	
D. The Montgomery County Primary Management Area (PMA)	
E. Septic Field Requirements Within the PMA	

## TABLE OF CONTENTS (continued)

	<u>Page</u>
Glossary of Terms .....	44
Appendix A Requirements for Floodplain Delineation .....	51
Appendix B Erodible Soils List .....	53
Appendix C Hypothetical Subdivision Showing Delineation of Stream Buffers .....	54
Appendix D State Designated Water Use Classification - List and Map for Montgomery County Streams .....	55
Appendix E Best Management Practices .....	58
Appendix F Performance Monitoring .....	60
Appendix G Environmentally Sensitive or Special Protection Areas Which Require Detailed Project Review.....	62
Appendix H State Patuxent River Policy Plan Recommendations .....	64
References .....	68

## LIST OF TABLES AND FIGURES

Table 1	Recommended Minimum Stream Buffer Widths.....	9
Table 2	Criteria for Determining Primary Management Area Applicability.....	37
Table 3	Recommended Environmentally Sensitive Land Features to be Included in the Stream Buffer Area.....	38
Table 4	Possible BMPs.....	41
Figure 1	Natural Resources Inventory.....	6
Figure 2	Buffer Determination Illustration.....	10
Figure 3	Illustration of Wetland and Floodplain Buffers.....	18
Figure 4	Hawlings River Subbasin.....	35
Figure 5	Primary Management Area.....	36
Figure 6	Publicly Owned Land - Patuxent Watershed.....	39
Figure 7	Water Use Classes - Patuxent Watershed.....	40
Figure 8	Water Use Classes for Montgomery County.....	57

The management strategies and guidelines stipulated in this document are for staff use in formulating recommendations to the Planning Board; the Planning Board, at their discretion, may waive or amend them.

Staff use of these guidelines was approved by the Planning Board on January 7, 1993. These guidelines supersede all other versions.

## **I. PURPOSE**

The intent of these guidelines is two-fold; the first is to describe the process of identifying and preparing a Natural Resources Inventory (NRI) for development sites, and the second is to establish guidelines for the protection of natural resources being adversely affected by construction activities during the development process. The recommended guidelines have been prepared to ensure that development plans include adequate consideration of the following environmental management objectives:

- \* maintenance of biologically viable and diverse streams and wetlands;
- \* protection of stream water quality;
- \* reduction in flood potential;
- \* protection of water supply reservoirs against sedimentation and eutrophication;
- \* conservation of forest and trees;
- \* protection of steep slopes;
- \* preservation/protection of wildlife habitat and exemplary communities, including rare, threatened and endangered species;
- \* protection against development hazards on areas prone to flooding, soil instability, etc.; and
- \* provision of visual amenities and areas for recreation and outdoor education activities.

Additionally, these guidelines provide detailed support for sensitive area elements of the Montgomery County General Plan as amended by local area master plans. Sensitive area elements are required in all local jurisdiction plans, pursuant to COMAR Article 66B (Zoning and Planning), 3.05-01 (viii), and are to contain goals, objectives, principles, policies, and standards designed to protect, from the adverse effects of development, sensitive areas, including the following:

1. Streams and their buffers;
2. 100-yr floodplains;
3. Habitats of threatened and endangered species; and
4. Steep slopes.

The General Plan and local area master plans articulate county-wide and planning area-wide goals, objectives, principles and policies for the protection of sensitive areas as identified by COMAR Article 66B, and these guidelines provide the detailed criteria and methods for implementation of these goals at the regulatory review level. The guidelines contain an additional Environmentally Sensitive Areas section which describes additional

review elements for areas that are determined to require special protection (Art.66B-3.05-02).

This document contains a compilation of the approved "Staff Guidelines for the Protection of Steep Slopes and Stream Valleys" (MNCPPC, 1983), the approved "Patuxent River Watershed Primary Management Area Guidelines" (MNCPPC, 1991), and other existing policies and guidelines with a minimum amount of modification. The guidelines include incorporation of state wetland and dam breach/danger reach regulations and county floodplain and forest conservation regulations. The wetland guidelines include prohibition of certain types of disturbance and use of wetland buffers. The goal is to obtain no net loss of wetland acreage and function, as mandated by the State Nontidal Wetlands Act. In cases dealing with such issues as floodplain protection, dam breach/danger reach analysis, and SWM/Sediment and Erosion Control, where M-NCPPC is not the lead enforcement agency, the information needed for staff use in making recommendations to the Planning Board will be required and reviewed in coordination with the lead agency. The exception to this practice is the wetlands guidelines, in which requirements to delineate wetlands are for the purpose of avoiding disturbance and are separate from the wetlands disturbance permitting process. Forest conservation requirements are in accordance with State and County Forest Conservation Laws and are dealt with in detail in the Trees Technical Manual, (M-NCPPC, 1992).

It is hoped that through the identification of existing natural resources and the application of these guidelines, it will be possible to obtain a balance between accommodating the level of development permitted in the zone and protecting the county's existing natural resources. Unlike some jurisdictions, these guidelines do not delete the environmentally sensitive lands from density calculations; however, the amount of constrained area should be considered during the master plan and zoning process to assure that intended densities and housing types can be achieved on the unconstrained areas. These guidelines have been reviewed by staff of local and state agencies and the Montgomery County Water Policy Group. Their comments have been incorporated.

## II. INTRODUCTION

Despite substantial effort by citizens, regulators, and the development community to date, development pressures in Montgomery County have placed increasing demands upon the county's natural resources. These demands have caused degradation of the resources and loss of the benefits they provide. If preserved and maintained in their natural condition, resources such as streams, stream valleys, wetlands, forests and trees constitute important physical, aesthetic, educational, recreational and economic assets to the county.

Decreased native vegetative cover, flooding, accelerated land surface and stream channel erosion, and sediment deposition constitute some of the major interrelated negative effects experienced during and after development. Erosion and sedimentation exist at natural background levels in the absence of human activities. However, a problem of varying severity occurs as human activities modify the natural landscape. Of special concern is the disturbance of steep slopes, especially those adjacent to or in close proximity to streams or drainage courses, and the disturbance of natural stream channels, floodplains and wetlands. The alteration of these areas exacerbates watershed erosion/sedimentation, and contributes to water quantity and quality problems.

The negative effects of unmitigated development noted above are directly related to increases in land surface imperviousness. Increases in imperviousness can have significant effects on the county's stream systems through the alteration of the natural stormwater infiltration processes and significant increases in the natural levels of overland flow. The alteration to natural infiltration and overland flow processes results in an increase in the velocity, volume and peak discharge of stormwater discharged to streams, and decreased lag-time between the onset of rain events and delivery of peak discharge to the stream system, as stormflow is concentrated and rapidly transported to the stream systems via impervious surfaces and storm sewers. The effects on the stream systems include enlargement of the channel cross-section and reduced channel efficiency as well as increased water temperature, resulting in impairment of water quality and stream habitat. In addition, the decrease in infiltration of stormwater can result in decreased groundwater recharge and decreased stream baseflow levels, which also has an effect on stream temperature and lowflow in-stream habitats. Significant impacts to riparian habitats, including wetlands, result from the extreme variation in water level caused by increased peak discharges and velocities. Impervious surfaces also transport sediment and other pollutants, such as heavy metals and salts associated with roadways, to the county streams. Increased sediment and pollutant loads impair stream habitats and water quality.

These guidelines for development are based on the principles of comprehensive watershed management and protection including:

- \* stream valley protection;
- \* limiting increases in watershed imperviousness;
- \* protection of both upland and riparian forest resources;

- \* recognition and protection of the ecological significance and functions of headwater areas;
- \* the need for baseline monitoring to understand and protect the county's stream systems;\*
- \* the consideration of cumulative impacts.

The guidelines attempt to address the problems and opportunities encountered in watershed development and identify management strategies designed to minimize adverse impacts. Among these management strategies are:

- \* the application of judicious land uses which allow for limiting impervious surfaces and maintaining wetlands, floodplains, seeps, bogs, etc., in their natural condition;
  - \* the establishment of protected slope areas which address slope gradient, soil erodibility and proximity to stream channels;
  - \* the use of stream buffers, the widths of which depend upon the stream's Maryland Department of the Environment (MDE) use designation, the gradient of adjacent slopes, and the presence of erodible soils;
  - \* the provision of healthy forest and tree cover for the purpose of maintaining water quality, preserving wildlife habitat, preventing erosion, mitigating air pollution, controlling temperature and enhancing community amenity in an urbanizing environment;
  - \* the adherence of land-disturbing activities to the state erosion and sediment control standards;
  - \* the provision of stormwater management structures, storm drainage systems, septic fields, and other facilities in a manner that respects the integrity and does not upset the natural equilibrium of stream systems;
  - \* the incorporation of best management practices into land disturbance activities.
- 
- \* The Planning Board supports long term baseline water quality monitoring to evaluate watershed response to development, including the utilization of voluntary programs to obtain baseline information.

### III. NATURAL RESOURCES INVENTORY

Environmental information should be gathered by conducting a Natural Resources Inventory (NRI) of the development site. The NRI is a complete analysis of existing natural resources and must contain specific information covering the development site and the first 100 feet of adjoining land or the width of the adjacent lot, whichever is less (Fig. 1). In general, the inventory must be done for all preliminary plans of subdivision and 59-D-3 site plans, before scheduling of the Subdivision Review Committee meeting. It is submitted as part of the Natural Resources Inventory/Forest Stand Delineation (NRI/FSD) Summary Map as detailed in the Trees Technical Manual.

The following topics shall be addressed as part of the NRI to assure compatibility between the natural and man made environment:

#### A. Streams and Floodplains

All streams and/or drainage courses located on or within 200' of the subject property must be shown. M-NCPPC 1"=200' scale topographic maps or applicant's field topography will be used to determine whether or not streams and/or drainage courses are present. Streams will be classified as either perennial (presence or indication of base flow from groundwater or springs for all or part of the year), intermittent (base flow through much of the year but may experience dry periods in late summer and early fall), or ephemeral (flows only in response to precipitation event). Streams will be assumed to be perennial unless field inspection proves otherwise.

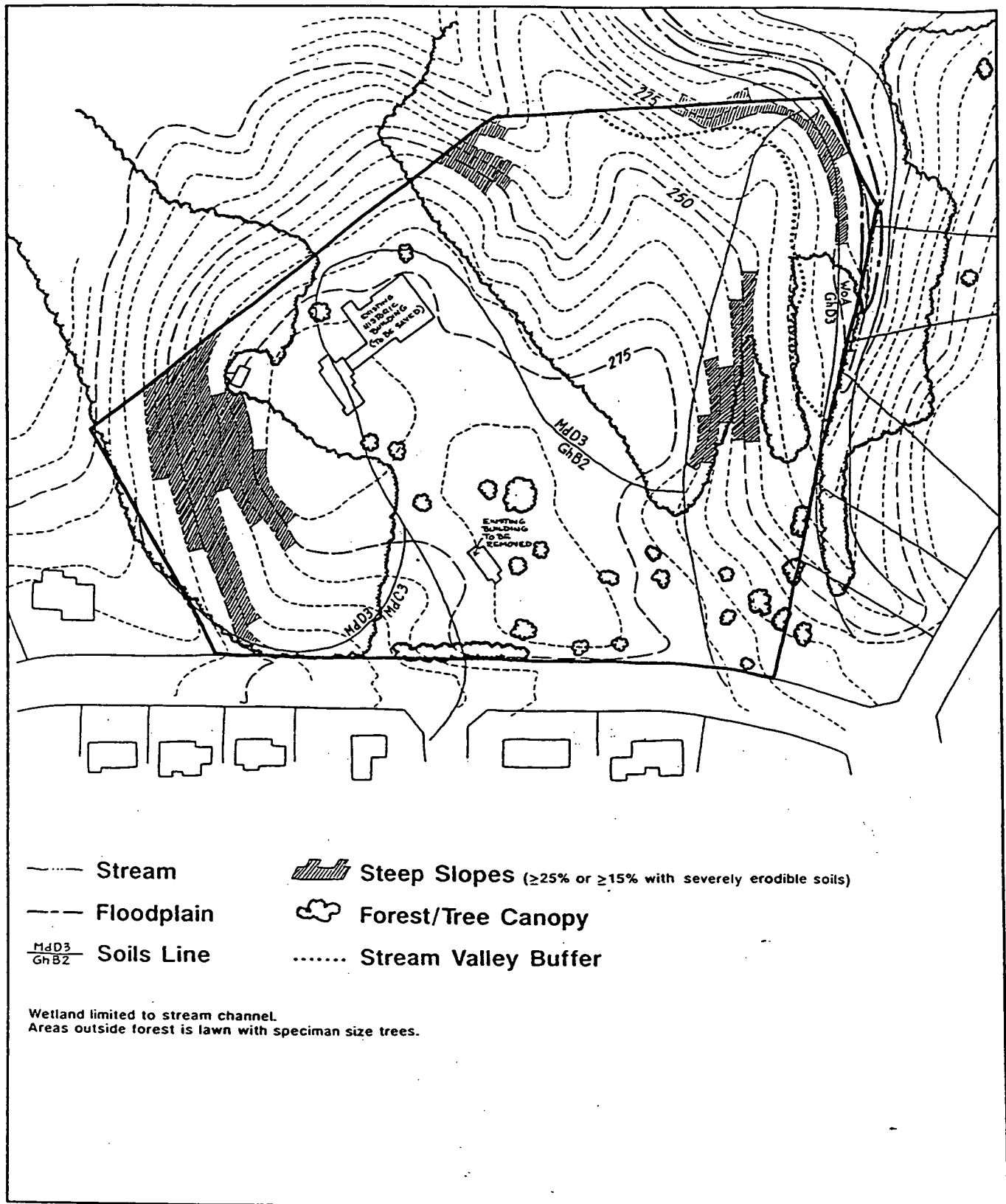
All streams shown on M-NCPPC 1"=200' topographic maps will be assumed to have a floodplain. Where M-NCPPC ultimate floodplain delineation is available, the applicant shall use and identify that information unless more accurate delineation (based on hydrologic/hydraulic computations and/or detailed topography or field survey) is provided. In the absence of M-NCPPC maps, other sources of floodplain information may include FEMA Flood Insurance Rate maps, HUD's Flood Hazard Boundary Map, and engineers' floodplain studies. Final approval of engineers' studies must be given by the Montgomery County Department of Environmental Protection (MCDEP) prior to Planning Board approval of development applications.

For drainage areas less than 30 acres, a drainage study including delineation of flowpath, and limit of flooding may be required, with concurrence from MCDEP. These cases will be determined on an individual basis.

The floodplain must be shown on the inventory map by topographic delineation of floodplain with a 25' Building Restriction Line (BRL). For an engineer's floodplain study, computations and all other information necessary to support the 100 year ultimate floodplain elevations shall accompany the preliminary plan submission and be reviewed at that time. Appendix A contains the requirements for floodplain documentation and delineation.

Fig. 1

# Natural Resources Inventory



In rural areas of the county, less detailed methods of calculating floodplains, such as the normal depth method (flow in stream channel divided by cross sectional area), may be appropriate. M-NCPPC staff may, with concurrence from MCDEP, accept these approximate floodplain studies for rural zoning areas (i.e., density no higher than one house per five acres) in watersheds of 200 acres or less. However, staff may require detailed floodplain analysis in any instance where 100 year flooding might affect building placement or grading, regardless of zoning or drainage area size.

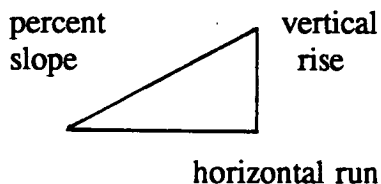
## **B. Stream Buffers**

Stream buffers shall be provided in accordance with Table 1 for all perennial and intermittent streams and will include significant seeps and springs. The slope range for use with this table will be determined by taking representative 200 foot cross sections on both sides of the stream, drawn perpendicular to the direction of flow, and measuring the gradient of the slope in the steepest 100 foot horizontal run. This procedure is illustrated in Figure 2. For hypothetical examples of stream buffer delineation, see Appendix C. The stream buffer will include steep slopes as defined in section C. Topography, 100-yr floodplains, and wetlands with wetlands buffer. The Planning Board, at their discretion, may increase, decrease or waive stream buffer requirements on a case by case basis. Individual master plans may recommend stream buffer requirements in addition to those in this document.

## **C. Topography**

Slopes shall be classified on the inventory map and all steep slope areas shall be highlighted. A slope which has a gradient equal to or greater than 25 percent will be considered steep.

Percent slope is defined as vertical rise in feet divided by horizontal run in the steepest 100 foot segment multiplied by 100%.



$$\text{percent slope} = [(\text{vertical rise in feet}) / (\text{horizontal run in feet in the steepest 100 foot segment})] \times 100\%$$

Slopes are classified as being either: 1) near stream or hydraulically adjacent or 2) hydraulically remote. The term "near stream" generally refers to the area lying within 200 feet of a stream's bank, which is considered to be the most environmentally sensitive or critical portion of the stream valley. If the stream buffer, as determined by the steepest 100' section within the hydraulically adjacent area (Table 1) encompasses the toe of a steep slope, the buffer will be expanded beyond the width in Table

1 to include the entire slope. A hydraulically remote area lies outside the stream buffer.

#### **D. Highly Erodible Soils**

The USDA Soil Conservation Service (SCS) Highly Erodible Lands Report for Montgomery County lists all soils in the Interim Soil Survey occurring on 8% and greater slopes as being highly erodible, with the exception of six soil types: 2UC, 7UC, 24C, 55C, 66UC, and 116C (Appendix B). The determination of highly erodible soils by the SCS is based on the erodibility index of the soil:  $RKLS/T$  (R, rainfall and runoff factor x K, susceptibility of soil to water erosion x LS, combined effects of slopes length and steepness) divided by T, tons of soil lost per acre per year. Development on highly erodible soils outside of the stream buffer should be carefully managed to avoid erosion problems and sediment transport to streams and storm sewer systems. Plans showing development on highly erodible soils will be required to propose management strategies in the following order of priority: 1. Avoidance and minimization of disturbance; 2. Environmentally sensitive site design; 3. Reforestation/ afforestation and vegetative stabilization; 4. Best management practices including expansion of stream buffer and cluster design; 5. Innovative and stringent use of sediment and erosion control measures.

#### **E. Wetlands**

All wetlands, as defined by the Maryland Department of Natural Resources, must be shown on the preliminary/site plan overlay or inventory map. Prior to the submittal of a preliminary plan, an applicant must have a qualified individual or consultant perform a wetland assessment. The results of the assessment should be either a line denoting the edge of wetlands on the plan overlay or inventory map, or a note stating that no wetlands exist on the site. The name and address of the individual who conducted the wetland assessment should be on the plans. For plans which will undergo 59-D-3 site plan review, the U.S. Fish and Wildlife Service National Wetlands Inventory maps, Maryland Department of Natural Resources (DNR) maps, and other sources designated by Maryland Department of the Environment (MDE) may be acceptable at preliminary plan, to be followed by field investigation at site plan. These instances will be determined by staff on a case by case basis.

**Table 1. Recommended Minimum Stream Buffer Widths\*, In Feet from the Stream Bank and by Stream Water Use Classification\*\***

Slope Range	Use I/I-P (Water Contact Rec. and Aquatic Life)	Use III/III-P (Natural Trout Waters)	Use IV/IV-P (Rec. Trout Waters)
0 to <15	100	150	125
15 to <25	125	175	150
25 and greater	150	200	175

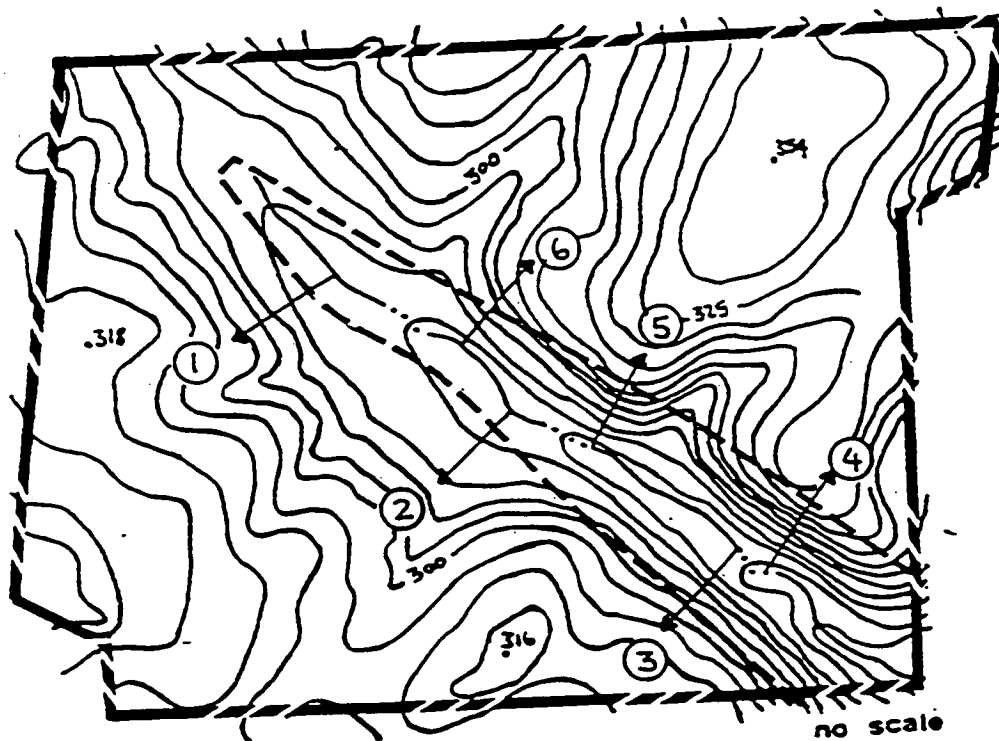
\* Stream buffer widths may be greater if floodplains, wetlands or steep slopes extend beyond the buffer line, or as noted in Section VII. In agricultural zones, the requirements for the buffer may be waived when the land will be used for farming. This waiver will be conditioned upon the applicant getting an approved Montgomery Soil Conservation District (MSCD) conservation plan. These instances will be determined on a case by case basis.

\*\* Stream Water Use Classification will be determined by the MDE Water Use designation (for definition, listing, and map see Glossary of Terms and Appendix D.)



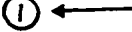
Note: Plans located in the Patuxent River watershed will be subject to Primary Management Area restrictions and guidelines in addition to the stream buffer widths above. Agricultural portions of plans to be located in this watershed will be subject to other stream buffer widths. See Section VII of this guidelines document.

Figure 2. Buffer determination using stream bank slope for a Use I/I-p stream

Cross Section Number	Maximum Slope (steepest 100')	Percent Slope Range	Recommended Stream Buffer Width (feet)
<b>Right Bank (looking downstream)</b>			
1	7%	0-15	100
2	7%	0-15	100
3	26%	> 25	150
<b>Left Bank (looking downstream)</b>			
4	35%	> 25	150
5	27%	> 25	150
6	15%	15-25	125



Legend

-  Subdivision Boundary
-  Stream Buffer
-  200' Cross Section and Section Number

## **F. Forest and Trees**

Natural forest and tree cover from recent aerial photos shall be shown on the inventory map as a circumferential line around all forest and tree stands which includes the outer perimeter of the branches of the individual trees.

A detailed delineation of forest and trees within these boundaries must also be provided. The requirements and methodology for this delineation are contained in the Trees Technical Manual adopted as part of the Montgomery County Forest Conservation Law.

## **G. Unsafe and Unsuitable Land**

Environmentally sensitive site design depends on knowledge of the nature and degree of constraints and opportunities offered by a given site. Identification of unsafe or unsuitable land is an integral part of this analysis, both from the standpoint of providing safe and habitable buildings, and for providing protection and conservation of natural resources such as streams, wetlands, forests and trees. The primary reason for classifying land as unsafe or unsuitable for development has to do with soils/geology, topography, and surface and subsurface water hazards.

In the past, there have been instances where failure to recognize existing soils constraints have resulted in buildings which experience severe flooding, wetness problems and/or, over the long run, structural problems. Therefore, soil boundaries shall be identified on the inventory map. In addition, development limitations shall be provided either in a separate report or as a note on the plan drawing. Severely limited areas shall be highlighted on the plan drawing. Soils with severe limitations for development are those which have one or more of the following characteristics as identified in the most recent version of the "Soil Survey for Montgomery County, Maryland", prepared by the United States Department of Agriculture Soil Conservation Service:

- (1) seasonal high water table,
- (2) subject to flood hazard,
- (3) poor drainage,
- (4) wetland/hydric soil conditions,
- (5) high shrink/swell potential,
- (6) shallow depth to bedrock,
- (7) excessive slopes,
- (8) high susceptibility to erosion.

A geotechnical report prepared by a professional engineer/geologist, may be required as a part of preliminary/site plan submittal when it is determined that the developer cannot avoid building on soils with severe limitations as identified above, and there are concerns with respect to structural safety and/or environmental degradation and more detail of soil and geologic characteristics is necessary to determine that soils can support development using suitable engineering measures.

#### H. Danger Reach/Dam Break Analysis

M-NCPPC, in consultation with MCDEP and the Maryland Water Resources Administration (WRA), incorporates danger reach/dam break analysis in the NRI submittal in order to identify relevant land use issues early in the process, and to protect existing houses against dam failures from new ponds and to protect proposed subdivisions against an existing or proposed ponds' dam breach. (Danger reach/dam break information, as described in this section, for proposed ponds should be submitted with the preliminary/site plan.)

For all development applications which have a dam, as defined below, on site, or where the property is one mile or less downstream of a dam, an applicant must show the Danger Reach (area inundated by the Dam Break Flood), footprints of existing structures, and spot danger reach water surface elevations on the inventory map. This information will be subject to verification by MCDEP.

Additional information which may also be required with the preliminary/site plan, in consultation with MCDEP, includes:

- \* Information on the dam itself, including storage volume and the hazard classification;
- \* Dam break analysis using HEC-1, DAMBRK, TR-66 or other appropriate models;
- \* Flow path/channel to carry such a flood.

For the purpose of regulatory review by the Environmental Planning Division, a dam will be defined as any structure for which any one of the following criteria apply:

- a) has a drainage area to the impoundment of 400 acres or greater,  
OR;
- b) has an embankment height greater than or equal to 20 ft. as measured from downstream toe to lowest point on top of embankment. (The above analysis may be reviewed and approved by DEP prior to issuance of building permit.)  
OR;
- c) total reservoir storage volume is greater than 20 acre-feet (for wet or dry ponds).

M-NCPPC has maps showing the danger reaches for Little Seneca Lake, Lake Needwood, and Lake Frank.

#### I. Threatened and Endangered Species and Species in Need of Conservation

The habitat location of flora and fauna that are designated as rare, threatened, endangered, in need of conservation, and watchlist species (as designated by the Maryland Natural Heritage Program, Department of Natural Resources), if identified during the review process, shall be shown on the inventory map.

The M-NCPPC Department of Parks should be consulted when parkland is adjacent to a site, to determine the location of any special habitat areas within parks that may require special buffering and/or protection measures.

#### **IV. GUIDELINES FOR DEVELOPMENT**

In Montgomery County, protecting and improving the water quality of our streams is a major planning goal. This goal is particularly important because the county is part of the Chesapeake Bay watershed. Preservation and clean-up of the Bay is a major state priority. Therefore, the environmental guidelines are largely based upon the principles of comprehensive watershed and stream valley management.

The guidelines have been developed with consideration of existing policies and practices in other jurisdictions. An attempt has been made to remain consistent with these other areas. Additionally, these guidelines attempt to consolidate and coordinate environmental site development issues which impact and are impacted by land use decisions. The guidelines are intended to promote and encourage interagency cooperation at the earliest planning stage possible.

The following guidelines will be applied to protect sensitive environmental features on development plans, as identified by the Natural Resources Inventory. They will be the basis for formulation of staff recommendations to the Planning Board.

##### **A. Stream Valley Protection**

The slope classification system and stream buffer widths outlined in section III are the basis for the following recommended guidelines which address stream buffers; including hydraulically adjacent slopes, hydraulically remote slopes, and approved clearing and grading within these areas or that affects these areas. The guidelines are designed to provide greater protection, through use of stream buffers, for the more environmentally sensitive, hydraulically adjacent steep slope areas.

##### **1. Recommended Guidelines For Stream Buffers**

- a) Streams, natural surface springs, and seeps will be maintained in a natural condition so that the hydraulic regimen and state water quality standards can be maintained.  
(Note: Protection of headwater areas in addition to that provided by the stream buffers is addressed at the master plan level. Additional headwater protection may be incorporated into these guidelines after adoption of the Montgomery County Water Quality Plan.)
- b) No building/structure, impervious surfaces, or activities requiring clearing or grading (except for necessary utility or stormwater management construction) will be permitted in stream buffers. However, small amounts of clearing and grading within these areas may be approved on a case by case basis by the Planning Department staff during plan review prior to the Planning Board hearing, with the requirement that the disturbed area and/or an equivalent area of greater environmental sensitivity be reforested or replanted. After Planning Board approval and prior to issuing of sediment control permits, DEP in consultation with the Planning Department staff may approve additional small amounts of clearing and grading that may be necessary to facilitate installation

of stormwater management or sediment and erosion controls. Unavoidable road and utility crossings will be permitted in the stream buffer only when it is demonstrated that no feasible alternatives exist, and every effort is made to locate road alignment and/or utilities to create the least disturbance to existing vegetation, grade, wetlands, etc.

- c) Where feasible, utility easements shall be set back a minimum of 50 feet from all stream banks. In-stream placement of sediment control devices, stream crossings, and channel modifications must be avoided whenever possible.
  - d) Deposition or stockpiling of any material such as excavated rock, topsoil, stumps and shrubs, grass clippings and building material within the designated stream buffer is strongly discouraged. Activities such as composting or topsoil stockpiling, that are necessary to restore an area within a utility easement or temporary sediment control area, may be approved on a case by case basis by Planning Department staff prior to approval of the plan when no other alternative is available. These same activities may be approved by DEP, in consultation with Planning Department staff, after approval of the plan and prior to issuing the sediment control permits.
  - e) Septic fields are prohibited on slopes greater than 25% (MDE regulation).
  - f) Septic fields and reserve fields shall be set back a minimum of 100 feet from all perennial streams. When the stream buffer or floodplain is wider than 100 feet, the required set back will be increased to keep the septic field outside these areas. Current county regulations requiring septic field setbacks from streams, steep slopes, water supply reservoirs, etc., must also be met.
  - g) No sewage disposal systems may be located within 300 feet of the normal high water level of a water supply reservoir, or within 200 feet of the banks of any stream that feeds therein (County Health Department Regulation).
  - h) Erosion and sediment control measures which are more stringent than the minimum required by state and county regulations may be required as a condition of plan approval by Planning Department staff for properties within a Use III/III-P watershed, and where a potential for severe erosion exists [M-NCPPC staff will consult with the Montgomery County Department of Environmental Protection (MCDEP), and the Montgomery Soil Conservation District (MSCD) prior to requiring these more stringent measures]. Areas which are subject to this condition will be highlighted on the approved plan.
2. Recommended Guidelines For Steep Slopes Outside the Stream Buffers (Hydraulically Remote)
- a) Septic fields and reserve fields are prohibited on slopes greater than 25% (MDE and County regulations).

- b) To the extent possible, hydraulically remote steep slope areas should be incorporated into the site's open space and/or remain undisturbed. However, development of these areas may be approved on a case by case basis, where the developer can demonstrate that safety, county road standards, storm drainage/stormwater management, erosion and sediment control, engineering, tree preservation, soil stabilization, design, and planning issues are satisfactorily addressed. In addition, erosion and sediment control measures which are more stringent than the minimum required by state and county regulations, may be required as a condition of approval by Planning Department staff where a potential for severe erosion exists [M-NCPPC staff will consult with MCDEP, and MSCD prior to requiring these more stringent measures]. The areas which are subject to this condition will be highlighted on the approved plan.

### 3. Recommended Guidelines for both Stream Buffers and Hydraulically Remote Slopes.

In instances when a limited amount of clearing and grading is approved within the stream buffer area or in areas of hydraulically remote steep slopes, and when clearing and grading of surrounding areas may impact these areas, the following guidelines must be strictly adhered to:

- a) All clearing and grading activities shall strictly adhere to the Maryland State standards and specifications. Furthermore, it is strongly recommended that phased clearing and grading be used whenever feasible. In sensitive watershed areas (Use III/III-P and IV/IV-P streams), phased clearing and grading may be required for plan approval by Planning Department staff in consultation with MCDEP. Close coordination shall be maintained with the Washington Suburban Sanitary Commission (WSSC). All disturbed areas should be revegetated as soon as possible as required by the Maryland Standards and Specifications for Sediment and Erosion Control. Emphasis should be placed on reforestation of disturbed areas. In many instances, disturbed areas may need replenishment of topsoil before successful reforestation or revegetation can be implemented. Areas without suitable existing vegetated buffers (e.g., cultivation) should be stabilized or seeded prior to grading activity.
- b) Stormwater management plans which address water quantity and quality must be approved by MCDEP unless a waiver is granted. These plans should incorporate best management practices (see Appendix E), and/or respect natural stream channels.
- c) The location, design and construction of new development and transportation facilities will be carefully reviewed to avoid introduction of toxic materials into stream systems.
- d) In instances where a master plan or county-wide program identifies a need for water quality or other monitoring, or in environmentally sensitive watersheds, the Planning staff with the mutual assent of the applicant, may recommend performance monitoring to evaluate impacts of development proposals on the

environment (see Appendix F). Monitoring should not be considered a best management practice or measure that, in itself, can maintain or improve environmental conditions.

## **B. Wetland and Floodplain Protection**

### **1. Wetlands**

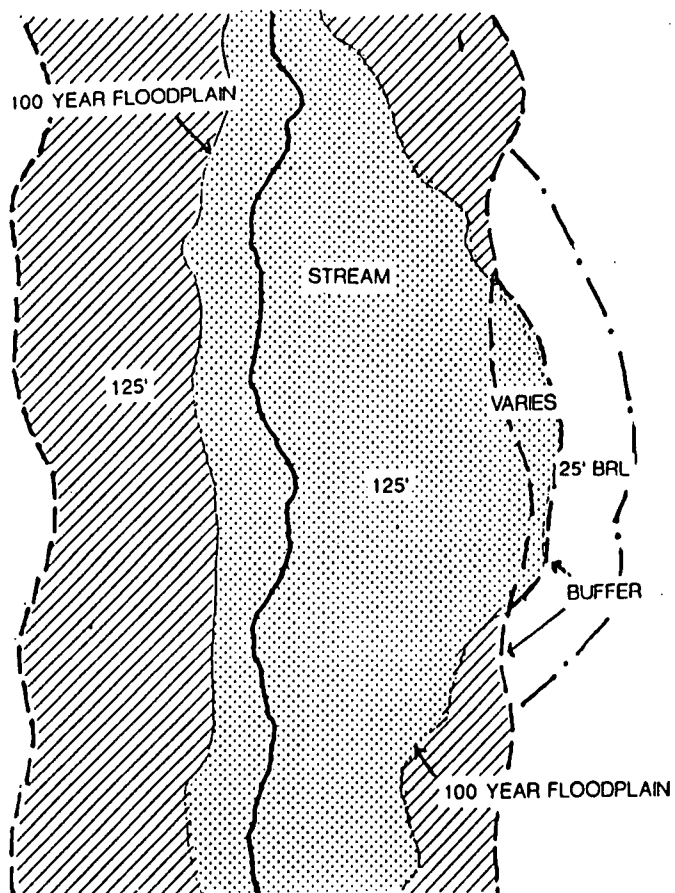
The wetland guidelines are based on the Maryland State Nontidal Wetlands Protection Act. It is the goal of the state's program to attain no net overall loss in nontidal wetland acreage and function and to strive for a net resource gain in nontidal wetlands over present conditions. In support of this goal, the following wetland guidelines will be followed during review of plans:

- a) Wetlands will be regulated in accordance with State (COMAR 08.05.04) and Federal Non-Tidal Wetlands Regulations (Secs. 401 & 404 of the Clean Water Act).
- b) A minimum buffer width of 25 feet will be established around nontidal wetland areas. The buffer will be expanded to 100 feet around wetlands of special state or county concern and around wetlands with adjacent areas containing steep slopes or highly erodible soils. When a wetland buffer extends beyond the stream buffer that would be required according to Table 1 of these guidelines, the stream buffer will be expanded to the wetland buffer line. For example, see Figure 3.
- c) The Planning Department evaluates proposed wetland impacts under the federal avoidance guidelines that are listed in order of preference as follows:
  - (i) Avoiding the wetland impact altogether by not taking a certain action or parts of an action.
  - (ii) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
  - (iii) Rectifying the impacts by repairing, rehabilitating, or restoring the affected environment.
  - (iv) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
  - (v) Compensating for the impact by replacing or providing substitute resources or environments.

Fig. 3 Illustration of wetland and floodplain buffers

FLOODPLAIN BUFFER  
FOR A USE IV/IV-p STREAM,  
0-15% SLOPES

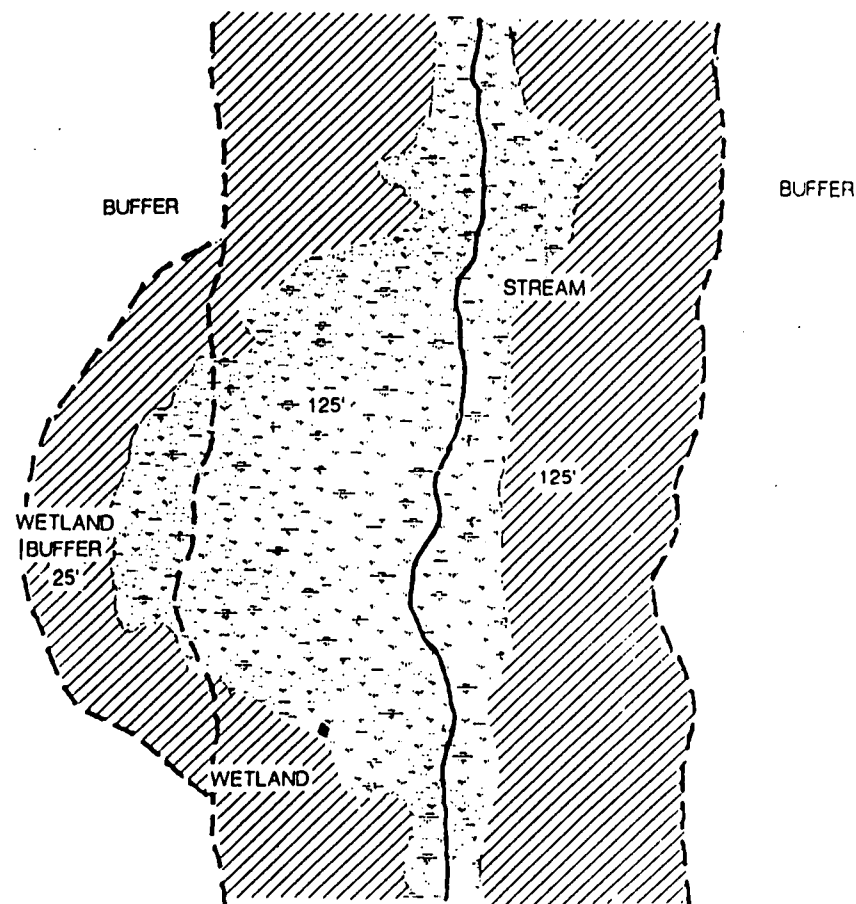
BUFFER CONSISTS OF EXTENT OF FLOODPLAIN  
OR 125' (WHICHEVER IS GREATER)



WETLAND BUFFER

FOR A USE IV/IV-p STREAM,  
0-15% SLOPES

BUFFER CONSISTS OF EXTENT OF WETLAND PLUS 25'  
OR 125' (WHICHEVER IS GREATER)



- d) Wetlands and their associated buffer areas shall be maintained in their natural condition unless the proposed disturbance is for a project determined to be necessary and unavoidable for the public good, such as:
  - (i) road crossings, sewer lines, and storm drain outfalls for which no alternative exists;
  - (ii) stormwater management facilities, when it can be demonstrated that upland areas are infeasible or would severely limit the performance/effectiveness of the facility;
  - (iii) park projects for wildlife and habitat; and
  - (iv) wetland quality improvements projects.
- e) Proposed alterations to areas designated as wetlands must be reviewed and approved by MDE, DNR and the U.S. Army Corps of Engineers (U.S. ACOE), as appropriate, prior to commencement of any alteration activities. Park and Planning staff may recommend deferral of final approval of development plans pending the permit decision for disturbance of wetlands of extraordinary quality or environmental sensitivity. These include:
  - 1. nontidal wetlands with threatened or endangered species or species in need of protection;
  - 2. nontidal wetlands of special state concern.

It is strongly recommended that conceptual approval of such alteration be received from these agencies prior to development of a site plan required by Section 59-D-3.

## 2. Floodplains

Floodplain guidelines are based on existing state and county regulations which govern development activities in these areas.

- a) No building/structure will be permitted within a horizontal distance of 25 feet of the 100-year ultimate floodplain (except as permitted in Chapter 19 of the County Code).
- b) In general, building in and near (within the 25' building restriction line) floodplains will be governed according to the regulations set forth in the sections of the County Code which relate to Floodplain Districts. A person must not engage in any land-disturbing activity within the floodplain district or within 25 feet of any boundary of the district unless MCDEP issues a floodplain district permit or exemption from the permit requirement.
- c) To ensure that the public is informed as to the existence of a floodplain, it will be delineated on the record plat, with reference elevations at critical locations. Reference elevations will normally be required only when there is a critical need, such as when a danger reach from a dam exists, or when an existing structure is proximate to, partially, or entirely in floodplain boundary.

- d) When the floodplain extends beyond the stream buffer that would be required according to Table 1 in these guidelines, the stream buffer will be expanded. For example, see Figure 3.

#### C. Forest and Tree Conservation

The requirements for forest and tree conservation are contained in the Montgomery County Forest Conservation Law. A Forest Conservation Plan is required as part of the preliminary/site plan. Guidelines for determining priority areas and details for submission of Forest Conservation Plans are included in the most recent version of the Trees Technical Manual.

#### D. Unsafe and Unsuitable Land Protection

##### 1. Recommended Soils Guidelines

- a) Development should avoid areas of the site which contain soils with severe limitations. In some cases, development may be prohibited or restricted in these areas as a condition of plan approval. Restrictions can include the requirement for implementation of engineered solutions, the use of building restriction lines, restriction of housing types (such as prohibiting basements), and relocation or deletion of lots.
- b) When no other options exist and development on problem soils cannot be avoided, a geotechnical report, prepared by a certified geotechnical engineer, will be required. This report will describe the soils limitations and the engineering measures necessary to protect against development hazards. When suitable measures are available that staff is convinced will mitigate the soils constraints over the long term, development will be allowed.
- c) An agreement between the builder/developer of the property and the M-NCPPC will be required to ensure that development occurs according to the recommendations of the report. Suggested versions of language for this agreement may be obtained from the M-NCPPC Environmental Planning Division or Legal Department. In addition, disclosure will be made to prospective homeowners.

#### E. Danger Reach

It is the policy of the Department of Environmental Protection and the Planning Board to keep all dwelling units outside the area inundated by the Dam Break Flood (Danger Reach), in order to ensure that a minimal risk is posed to public wellbeing and

property. In order to achieve this, the following techniques are employed where appropriate:

1. low density zoning;
2. use of cluster provisions in the Zoning Ordinance;
3. dedication/park acquisition/easement; and
4. regulatory review.

To ensure that the public is informed as to the existence of a dam and its potential to break, the danger reach area will be delineated on the record plat, with reference elevations at critical locations.

**F. Protection of Rare, Threatened and Endangered Species; Species in Need of Conservation and Watchlist Species**

When a rare, threatened or endangered species, a species in need of conservation, or a watchlist species (as designated by the Maryland Natural Heritage Program, Department of Natural Resources or Montgomery County) is identified, the applicant must avoid these areas unless an alternate plan is approved by the state and/or M-NCPPC. This includes the applicant identifying any habitats of these species that may be affected by development, and devising programs for their protection, in conjunction with the Maryland Department of Natural Resources.

## **V. ENVIRONMENTALLY SENSITIVE OR SPECIAL PROTECTION AREAS**

Because of the critical location or breadth of certain proposed projects, the Planning Department may need additional information to perform an adequate review. For projects that meet the criteria listed below, the Planning Department may require an environmental impact analysis in addition to the other requirements of these guidelines. Projects that do not meet the criteria below will undergo the normal review process.

### **A. Environmental Impact Assessment**

An environmental impact assessment may be required when a project is proposed in an environmentally sensitive or special protection area as identified below:

- 1) An area which has been identified as environmentally sensitive or in need of special protection in a master plan, functional master plan, Comprehensive Ten-Year Water and Sewerage Plan, or watershed technical study;

OR

- 2) The area is within a Use III or III-P, Use IV or IV-P, or sensitive Use I or I-P watershed or subwatershed; and
- 3) The project is of one or more of the following types or sizes (also see Appendix G for list of projects that would normally undergo detailed project review and may be subject to these requirements):
  - \* projects containing wetland areas of state (COMAR 08.05.04) or federal concern, and designated sole source aquifers;
  - \* projects with steep slope areas: specifically, a parcel with at least 20% of the land having greater than 25% slope, or with at least 30% of the land on erodible soils of greater than 15% slope (and majority of steep slope area cannot be incorporated into open space);
  - \* development proposals greater than 100 acres in size and within 400 feet of a stream;
  - \* projects for which high priority forest cover exceeds 50% of the site;
  - \* projects where significant plant communities are identified during the development process or have been previously documented (such as river outwash savannas, serpentine barrens, shale barrens, and in some cases, old fields with potential locations for rare plants);
  - \* stream stabilization or channel relocation projects;
  - \* projects that require construction of high hazard dams; and

- \* commercial, industrial, and institutional development projects where hazardous substances are handled.

For projects meeting the above criteria, an environmental analysis of the natural features, the impact of the proposed development, and the proposed mitigation measures may be required at the preliminary plan stage or earlier if an earlier approval is required by the Planning Board. Appropriate analyses and models should be utilized to assess impacts and efficiency of mitigation measures.

## **B. Submittal Requirements**

Depending on the location and type of development, the applicant may be required to provide information on any or all of the following items as part of the environmental impact assessment. The information requested is in addition to normal requirements of the NRI/FSD. (Other information may occasionally be requested to address site specific issues).

### **1. Analysis of Natural Features**

#### **a. Soils/Geology:**

- \* detailed information on soil types including drainage characteristics, susceptibility to erosion, and areas of moderate and severe erodibility;
- \* depth of seasonal high water table;
- \* geologic conditions; and
- \* areas suitable for infiltration.

#### **b. Vegetation:**

- \* inventory of site vegetation emphasizing stream-side vegetation; and
- \* wetland areas, mature wooded areas, and areas indicating stress (erosion, poor soils, steep slopes, etc.)

#### **c. Physical Habitat (Stream Environment)**

- \* stream characteristics:
  1. location and base flow of receiving stream;
  2. stream gradient;
  3. substrate;
  4. habitat suitability for trout, other game fish, and their supporting organisms;
  5. biological conditions, including existing macroinvertebrate populations (i.e., species composition and abundance) and phytoplankton populations;
  6. stream bank condition, including vegetative cover & channel bank stability;
  7. areas of channel or streambed erosion; and
  8. water temperature.

d. Groundwater:

- \* groundwater characteristics (e.g., depth, yield, and storage) for individual water systems;
- \* location and characteristics of springs and recharge areas.

e. Hydraulics:

- \* drainage characteristics of the site;
- \* existing and future channel flows and velocities (base flow and 2yr. storm);
- \* water surface profiles (2, 10 and 25-yr storm)

f. Water Quality:

- \* provide existing water quality data through baseline monitoring.

2. Analysis of Proposed Development

a. Size and Location of Development:

- \* percentage of wetlands and stream channel impacted by development;
- \* acreage of headwater areas impacted by development;
- \* percentage of imperviousness, categorized by:
  - a) road and driveway surfaces,
  - b) parking lots,
  - c) building and pavement coverage,
  - d) green space

b. Proposed Site Facilities

- \* proximity of water and sewer lines to the stream channels; and
- \* location of pumping stations and force mains.

c. Pre-development, Existing, and Post-development Annual Pollutant Loadings as Characterized by the Following Parameters:

- \* temperature;
- \* total suspended solids;
- \* dissolved oxygen concentration;
- \* turbidity;
- \* biochemical oxygen demand;
- \* nutrients (soluble and insoluble N and P);
- \* pH;

- \* toxics (including heavy metals); and
- \* other parameters as may be identified by staff on a case by case basis (such as fecal coliform and residual chlorine).

### **3. Proposed Measures to Mitigate Impacts of Development**

The analysis should identify and describe proposed measures to eliminate or mitigate impacts identified in the Analysis of Proposed Development (A,2, above). The appropriate mitigation methods should be incorporated into proposed plans and should make use of state-of-the-art-advances as well as established best management practices.

## **VI. IMPLEMENTATION**

Protection of natural features, as outlined in these guidelines, relies on adherence to construction standards and requirements and the establishment of undisturbed natural buffers. In order to provide for identification of these measures and ensure that they are carried out during development, the Planning Board may include one or more of the following methods of enforcement into the development plan approval.

### **A. Development Agreements**

When required by the Planning Board, the applicant/owners of the property shall enter into a binding agreement with the M-NCPPC to ensure that the constructed development meets appropriate standards and requirements defined in the conditions for approval of the plan. It is assumed that all county and state environmental standards will be met through normal regulatory and permitting processes. A development agreement may be required to ensure adherence to:

- \* noise mitigation requirements;
- \* forest and tree conservation and protection plans (as addressed in the Trees Technical Manual);
- \* requirements for engineering measures to address soils constraints;
- \* construction and maintenance requirements for off-site stormwater management facilities within parkland; and
- \* HOA maintenance requirements for stormwater management facilities.

The agreement shall be submitted for approval with the record plat submission. An executed copy is to be recorded with the first record plats and any subsequent plats. In addition, there is to be appropriate language included in the Homeowners Association documentation referencing the agreement and the obligations to be undertaken by the Homeowners Association.

During construction, and until the property and/or facility subject to the agreement is conveyed to the HOA, the responsibility for compliance with the agreement will remain with the developer. The developer shall convey such property/facility to the HOA with all customary warranties as to its fitness for the intended usage. When appropriate thereafter, the Homeowners Association shall assume responsibility.

Appropriate language for the development agreements will be worked out between the Planning Department staff and the Legal Department. Examples of the agreement language can be obtained from the Legal Department.

## **B. Conservation Easements**

Protection of natural features, as outlined in these guidelines, relies heavily on the establishment of undisturbed natural areas. A problem associated with the establishment of these natural areas is finding the appropriate method of enforcement. The lowest level of protection is implemented through development agreements or conditions of approval which control the limit of grading during the construction process. No permanent easements would be placed on the plat. Under this approach, protection beyond the construction period relies primarily upon the value of the resource to the first and subsequent homeowners.

In some instances however, the value of the resource requires a more permanent protection mechanism. In these cases, a conservation easement may be established to prohibit actions compromising the natural area both during and after construction. The limits of the easement shall be recorded along with the easement agreement. M-NCPPC Legal Department versions of the easement agreements will be pre-recorded in the Office of Land Records. These versions may be rewritten to suit specific circumstances and recorded by the applicant.

In general, situations for which long-term protection in the form of a conservation easement is necessary include: 1) all buffers identified in Use III/III-P streams, 2) stream buffers identified in Use I/I-P and IV/IV-P streams where the Planning Board finds that resources of exceptional quality exist, and/or the likelihood of buffer compromise is great, and 3) forest conservation areas (as detailed in the Trees Technical Manual).

Conservation easements may also be required to protect trees along the property boundaries of adjacent land for compatibility reasons. Appropriate long-term protection measures may be determined on a case-by-case basis. Applicants are encouraged to suggest methods other than conservation easements for long-term protection of natural areas.

## **C. Waivers of Base Zone Standards and Specifications for Environmental Reasons**

Various sections of the Zoning Ordinance require a finding by the Planning Board or County Council that a requested variance from standards will result in a development that is more desirable from an environmental perspective. They include: Section 59-C-1.621 concerning waivers of minimum percentages of certain housing types within MPDU developments; Section 59-C-1.395 concerning minimum percentage of housing types within TDR developments; Section 59-C-1.532 concerning minimum area for cluster developments within RE-2C and RE-1 zones; Section 59-C-7.131 concerning percentages for one-family and multi-family units; and Section 59-C-1.393(b) regarding a waiver of the 2/3 required number of TDR's for a development.

Staff will make recommendations on these findings based on information supplied by the applicant at preliminary plan. For purposes of comparison, all waiver submissions (except the waiver of provision of 2/3 the required number of TDR's) shall include a conceptual base zone development plan (i.e., a plan without waivers) that fully responds to environmental guidelines and regulations, and uses all available options to maximize

environmentally compatible development on the site. Requirements for justifying the waiver of 2/3 TDR's will be treated separately, since denial of this waiver would require either more units to be placed on the property, or more of the proposed units to be TDR's.

#### 1. Waiver Justification Based on Water Quality and Quantity Benefits

In high quality watersheds (Use III/III-P and IV/IV-P), and special protection or environmentally-sensitive areas as defined in Chapter V, the primary justification for such waivers to the base zone standards specified in the Zoning Ordinance shall be based on a finding that the proposed development\* provides a significant improvement to water quality and/or quantity which correlates to the magnitude of the proposed waiver. The effects of proposed development shall be compared to the effects of a conceptual base zone development plan, as defined above. In order to fully analyze an application for such waivers based on these benefits, the following minimum information shall be included with each submission, comparing the proposed development to base zone conditions:

- o discharge computations for the first 0.5" and 1.0" of runoff including the pre-development land use condition.
- o runoff computations for the 2-year and 10-year frequency storm including the existing land use condition.
- o pollutant loadings and/or concentration levels, and the frequency and magnitude of violations of state water quality standards. Include use of appropriate best management practices (BMPs), and the pre-development land use condition.
- o number of acres and the percentage of the site which will be impervious.
- o number of acres and the percentage of the site which will be disturbed.
- o number of acres of forest, pasture, and transitional areas.
- o number of acres within forest conservation areas.
- o conceptual location and type of stormwater management and storm drainage facilities.
- o number of acres of wetlands, showing areas of unavoidable disturbance and compensation areas.

\* Proposed development is the plan which requires the grant of a waiver for approval.

#### 2. Waiver Justification Based on Other Environmental Benefits

In all other areas of the county not included under section C. 1, or where water quality improvements, as required in sensitive watersheds, special protection or environ-

mentally sensitive areas are insufficient for waiver justification and need enhancement, staff will consider innovative and/or extraordinary measures to protect or improve the built and natural environment. Such measures must be demonstrated to be over and above the requirements or guidelines of the county, state, and M-NCPPC. Such measures may include, but not be limited to the following:

- o enhanced sediment control protection, and use of best management practices (BMP's);
- o SWM quantity and/or quality controls for a significant amount of off-site area that would not be controlled under the base zone scenario;
- o correction of existing off-site drainage and/or stream valley degradation problems, (e.g. through extensive reforestation, stream channel improvements, cleanup of debris, etc.);
- o unique site designs for noise mitigation, or mitigate noise levels through use of topography or barriers beyond what would ordinarily be required;
- o an afforestation/reforestation program beyond the minimum required;
- o dedication of land for conservation easement and/or parkland, if acceptable to the M-NCPPC Department of Parks;
- o water quality performance monitoring, the scope of which shall be determined on a case by case basis.

The measures listed above represent various means of protecting or improving the environment and will not be accepted as enhancements for waiver justification unless a case can be made that water quality will not be degraded, but rather protected or improved.

### 3. Waiver Justification for 2/3 Minimum TDR Requirement

The TDR (Transferrable Development Rights) waiver brings into focus tension that sometimes surfaces between two different, but equally important policy objectives: promotion of a strong TDR program, and environmental/compatibility protection issues. The TDR program strives to maintain a balance between the market supply and demand for TDRs, so that farmers have a place to sell and developers have a place to purchase TDRs. The zoning ordinance requires that a developer utilizing the TDR optional method of development must incorporate into their plan at least two thirds of the maximum number of TDRs allowed by the site's zoning and master planning designations. This is intended to maintain a vigorous market for TDRs involving those developers electing to so participate and, further, it is to ensure that sufficient density will be located on the site to warrant the public sector's commitment of providing supporting infrastructure, typically at an accelerated pace. In some instances a site may not be able to accommo-

date a higher level of density due to environmental or compatibility reasons. At that point, the Board must balance the need to achieve higher TDR density levels against the resulting intrusions which would occur against environmental or compatibility standards and expectations. This balancing is conducted through the TDR waiver request, allowing the Board to approve less density than would ordinarily be available on a less constrained site. Its characterization as a waiver may be misleading in that it is not a request to relax environmental protection to facilitate more density; rather it becomes a justification to realize less density.

In order to obtain the waiver, an applicant must demonstrate and the Planning Board must find that the proposed plan:

1. uses the most efficient combination of unit types to attempt to maximize density within the unconstrained area of the site;
2. is reasonably close to reaching the 2/3 number of TDRs required; and
3. that the level of encroachment into the constrained area of the site in order to obtain the full 2/3 TDRs is UNACCEPTABLE from an environmental standpoint, based upon the criteria set forth below.

The following points are implicit from the rationale for the waiver justification:

If the number of TDRs needed to meet the 2/3 requirement is small AND the area of encroachment is considered to be acceptable with appropriate environmental mitigation measures as determined by the Planning Board, the development may be allowed to encroach into the constrained area to meet the TDR requirement. Alternatively, the developer may choose to purchase the remaining TDRs to avoid mitigation measures.

If the number of TDRs proposed on the plan is NOT reasonably close to the 2/3s required and a different unit mix would not alter the ratio or be feasible, the Board may elect to deny the applicant's election to utilize the TDR optional method of development. Alternatively, the developer may be allowed to purchase the remaining TDRs in order to obtain the higher density.

The following development plan scenarios and elements will be analyzed to determine if the development plan applicant has established a case for justifying the environmental waiver:

1. The proposed plan delineating areas of environmental constraints indicating the proposed number and the particular unit types (include rationale for rejecting certain unit types over others);
2. Plan showing area of development utilizing the full 2/3 TDRs, showing development within both constrained and unconstrained areas, including mitigation proposals for development within the constrained area;
3. Quantitative analysis of percent of constrained area used versus percent of TDRs obtained.

4. Environmental analysis comparing plan 1 with plan 2, in terms of the following elements (to be determined by staff; not all elements may be required):
  - \* difference in discharge and runoff computations
  - \* pollutant loadings
  - \* imperviousness
  - \* acreage of forest/tree areas disturbed
  - \* acreage of stream buffer/wetlands disturbed

#### D. Exceptions to the Guidelines

The guidelines contained in this document form the basis for development and presentation of staff recommendations to the Planning Board, who may then choose to accept, reject, or modify these recommendations on a case by case basis. Exceptions to the guidelines may be given by the staff on a case by case basis where strict compliance with the recommendations herein would result in unreasonable hardship; and when it can be demonstrated that safety, county road standards, storm drainage, stormwater management, erosion and sediment control, engineering, design or planning issues can be satisfactorily addressed to benefit the environment, the general public, or both. Furthermore, staff are receptive to other ideas and techniques that enhance environmental compatibility.

## **VII. PRIMARY MANAGEMENT AREA (PMA) GUIDELINES FOR THE PATUXENT RIVER WATERSHED IN MONTGOMERY COUNTY, MARYLAND**

### **A. Background and Purpose**

The Patuxent River Policy Plan, adopted in 1984 by the General Assembly and the seven Patuxent watershed counties, was prepared by the Maryland Department of State Planning in order to give policy direction to local and state agencies in carrying out their programs and making regulatory decisions in the Patuxent River watershed. The watershed contains parts of seven Maryland counties: Montgomery, Howard, Prince George's, Anne Arundel, Calvert, Charles and St. Mary's. The following pages describe the Patuxent River watershed in Montgomery County and the Primary Management Area (PMA) guidelines being proposed by the Montgomery County Planning Department to protect the watershed. These PMA guidelines are being developed in accordance with the recommendation in the Patuxent River Policy Plan that local governments enact a Primary Management Area. The guidelines will address the decline in the Patuxent River's water quality and the need, from an environmental perspective, to protect this resource. In addition, these PMA guidelines respond to the economic necessity of protecting the primary water supply reservoirs and recreational resources provided by the Patuxent River. The purpose of the Montgomery County Patuxent River PMA guidelines is to provide urgently needed land management strategies to help control nonpoint source runoff and preserve, restore and protect the Patuxent, its drinking water supply reservoirs and the Chesapeake Bay. The guidelines have been approved by the Montgomery County Planning Board for use in the review of development proposals in the Patuxent River watershed.

### **B. Introduction: The Patuxent River**

The Patuxent River watershed, covering 910 square miles, lies entirely in the State of Maryland. This "scenic river", as designated by the State of Maryland, gently meanders through seven counties before draining into the largest and most bountiful estuary in the United States, the Chesapeake Bay. Approximately 61 square miles (39,065 acres) of Montgomery County drain into the headwaters of the Patuxent. In addition to being a tremendous recreational and economic resource, the river serves as a primary drinking water supply, containing both the Triadelphia and Rocky Gorge reservoirs. Both reservoirs are owned and operated by the Washington Suburban Sanitary Commission.

The Patuxent River, the reservoirs and the Chesapeake Bay are being heavily impacted by increasing pollution levels associated with land development and from the ongoing pollution associated with agricultural activities. Pollution impacting the Patuxent River and the Bay originates from both point and nonpoint sources. Point sources primarily include the piped discharge from sewage treatment plants and industry. The State 208 Water Quality Management Plan (208 Plan) for the Patuxent Basin (1983) contains the strategy for controlling point sources of pollution. Point source pollution is addressed by the appropriate state and county agencies and therefore will not be addressed by these guidelines. The State 208 plan, which was developed pursuant to Section 208 of the Federal Clean Water Act, also addresses the impacts from nonpoint sources of

pollution, which are a significant portion of the total sediment and nutrient pollutant load to the Patuxent River system.

Nonpoint source pollution is directly related to the land-use practices within the watershed and originates from urban, suburban and agricultural lands. Effective land management strategies are needed to control the increase of disturbed ground and impervious surfaces within watersheds, from which surface runoff generates, transporting harmful nutrients, sediments and pollutants to the river and its tributaries and causing adverse temperature changes. The 208 Plan for the Patuxent basin reported a serious decline in the river's water quality. Problems include increases in nutrient loading (particularly nitrogen and phosphorus) which result in harmful algal blooms and consequent harmful reductions in dissolved oxygen. The excessive algae coupled with increased sedimentation has also seriously increased the turbidity of the water. This increased turbidity prevents life sustaining sunlight from reaching submerged aquatic vegetation and results in reduced habitat and food sources for both waterfowl and juvenile fish, in addition to the reduction of vital dissolved oxygen. In 1981, the WSSC issued a report stating that "the reservoirs are aging at faster than acceptable rates due to high nutrient inputs".

### C. The Patuxent River Policy Plan

The Patuxent River Commission and the Maryland Department of State Planning developed the Patuxent River Policy Plan (state Policy Plan) in cooperation with all seven Patuxent watershed counties. This Policy Plan was approved by these counties, including Montgomery County, and the General Assembly in 1984. The seven watershed counties and the General Assembly have agreed to accord special management and planning consideration to the lands bordering the streams in the Patuxent watershed. By approving the state Policy Plan, Montgomery County, along with other participating counties, has agreed with the recommendation to develop and implement the primary management area approach to watershed protection.

Based on the recommendations of the state Policy Plan, a conceptual primary management area (PMA) has been proposed for the streams within the Patuxent watershed in Montgomery County. Using the state Policy Plan as a guide, the Montgomery County Planning Department is proposing a set of criteria and guidelines to be applied to local development reviews. These guidelines could be amended by a joint watershed management policy planning effort between Howard County, Montgomery County, Prince George's County, WSSC and the M-NCPPC.

The state's Policy Plan criteria for designating a PMA are not regulatory standards. Rather, they provide general guidance for developing locally enforceable criteria suited to local conditions. The state Plan contains ten major recommendations to direct land use planning and management toward watershed protection. For a complete list of the Policy Plan's ten recommendations, see Appendix H. Montgomery County's PMA Guidelines for the Patuxent River Watershed specifically address four of the ten recommendations put forth in the Policy Plan. These include state Policy Plan recommendations:

- A. "Establishing a Primary Management Area (PMA)",
- B. "Providing Best Management Practices (BMPs)",
- C. "Preserving Agricultural Land" and
- D. "Protecting Forest Cover"

Montgomery County is in support of all ten of the state Policy Plan's recommendations although at this time these guidelines address only four. It should be noted that not all the Policy Plan's ten recommendations fall within M-NCPPC jurisdiction. The Patuxent River Watershed Functional Master Plan will contain a more comprehensive plan which addresses other aspects of the state Policy Plan which fall under M-NCPPC jurisdiction.

#### **D. The Montgomery County Primary Management Area**

##### **1. Establishing a Primary Management Area (PMA) for the Patuxent River watershed in Montgomery County**

The Primary Management Area (PMA) is a water quality protection and restoration area where land use activities are managed to protect and enhance water quality in the rivers and streams. The PMA is composed of strips of land that run along the entire length of all streams within the watershed. The recommended land uses and related activities within the PMA are managed through a series of specially designed programs directed to promote water quality in the streams.

The purpose of the Patuxent watershed PMA is to identify and manage land from which nonpoint source pollution is most likely to be transported to the river, to the two water supply reservoirs and ultimately to the Chesapeake Bay.

Montgomery County's PMA for the Patuxent is consistent with the state's Patuxent River Policy Plan recommended PMA widths of 1/4 mile (1320') for the Patuxent mainstem and 1/8 mile (660') for all tributaries. In addition, Montgomery County is also recommending a 1/4 mile management strip (PMA) for the mainstem of the Hawlings River. The Hawlings River watershed, a subbasin in the Patuxent watershed, lies entirely in Montgomery County (Fig. 4). Greenhorne and O'Mara's Technical Report for the Patuxent River Watershed (February 1990) has identified the Hawlings River as a major contributor of nonpoint source pollutants to both the Upper Patuxent River and to the Rocky Gorge Reservoir.

FIG. 4 Hawlings R. Subbasin

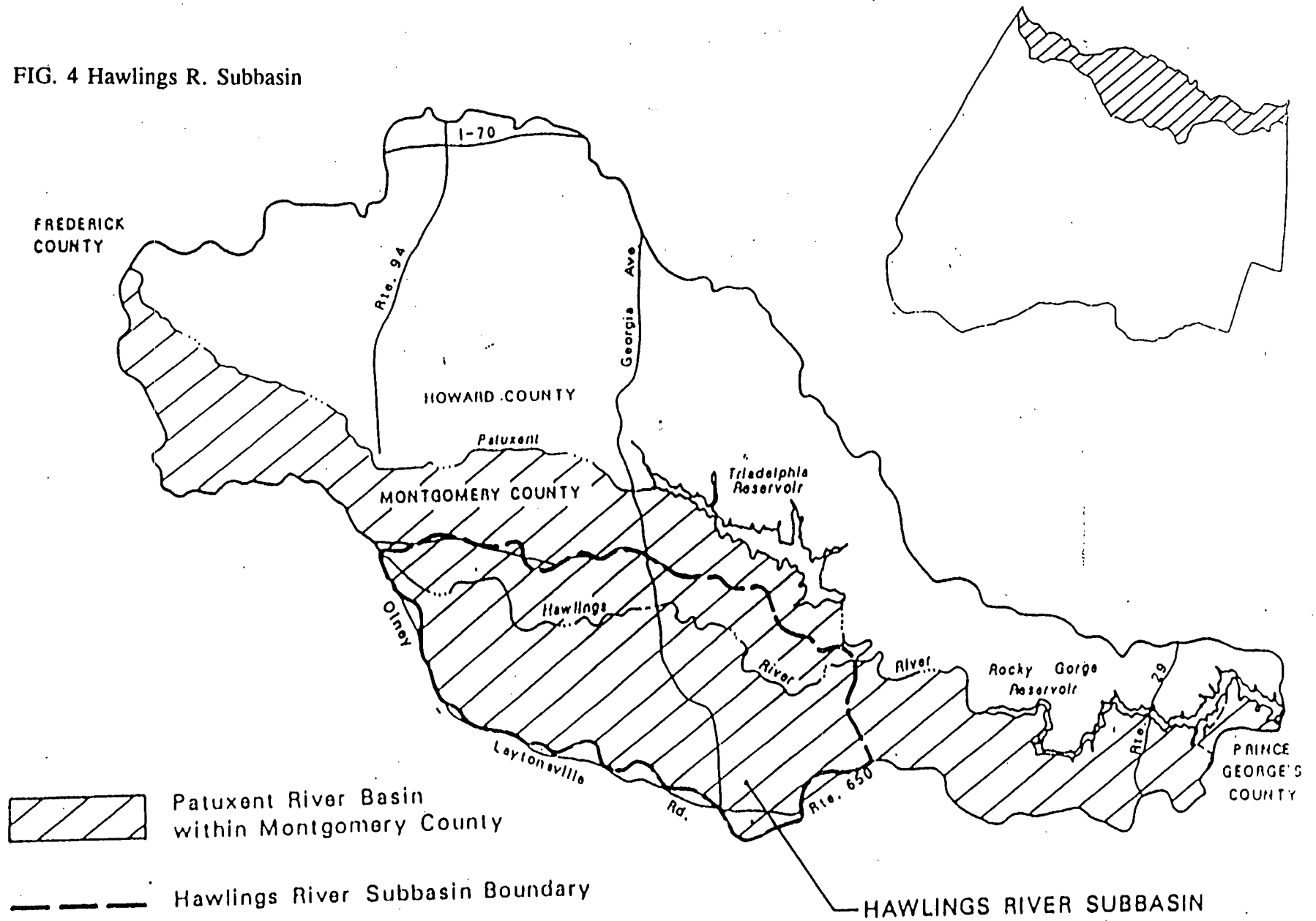
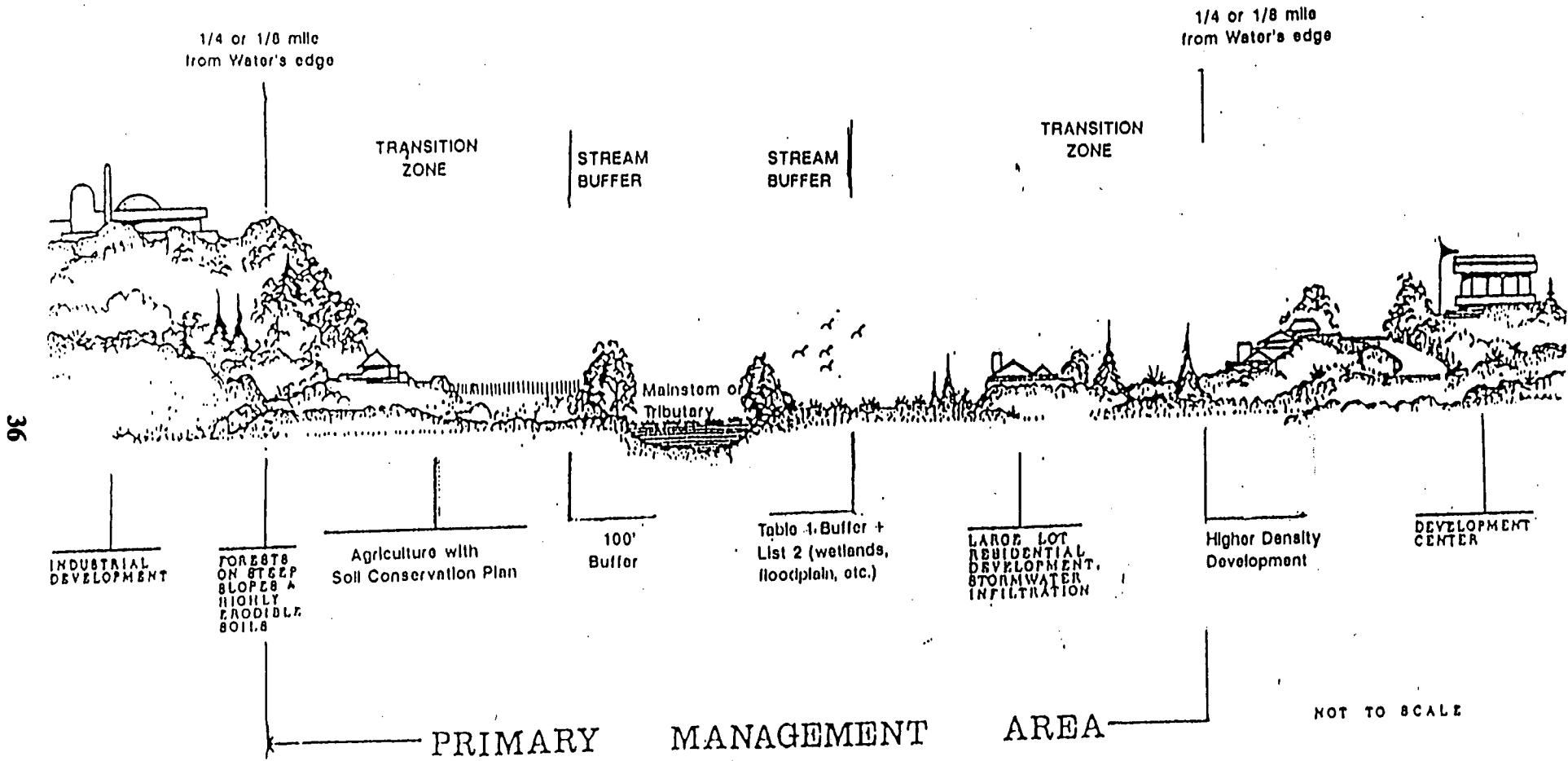


FIG 5 PMA



Conceptual Drawing of the Primary Management Area  
as Defined in the Patuxent River Policy Plan,

The area that will constitute the PMA as described above consists of approximately 17,488 acres, or approximately 45% of the Patuxent watershed.

a. Applicability

PMA guidelines will be recommended when the criteria in Table 2 (below) apply to a given property. Any properties which meet the criteria will then be required to delineate a Primary Management Area which will consist of a stream buffer and a transition area (Fig. 5).

---

Table 2. Criteria for Determining Primary Management Area Applicability:

1. the property contains or borders a stream which is tributary to the Patuxent and/or Hawlings River watersheds, OR the property is within a 1/4 mile of the mainstem or 1/8 mile of a tributary of the Patuxent and/or Hawlings River, and
2. the property has been submitted to M-NCPPC for subdivision and/or site plan review.\*

\* requests for children's lots which fall under the exempt provisions of the Montgomery County Zoning Ordinance do not subject a farm to PMA requirements, provided the farm is operated in compliance with the soil and water quality conservation plan as determined by the Montgomery Soil Conservation District (MSCD)

---

It is emphasized, at this time, that a property will be subject to PMA requirements ONLY when it is submitted to M-NCPPC for subdivision and/or site plan review. Agricultural land located within the Primary Management Area which is NOT submitted for review will not be subject to the recommended PMA requirements made in these guidelines. Land that remains in agricultural use, however, as part of a plan for subdivision, will be subject to the recommended PMA stream buffer and transition area requirements made herein (Section B. Preserving Agricultural Land).

b. Delineating the Stream Buffer within the PMA

Within the designated PMA, be it 1/4 mile or 1/8 mile, it will be necessary to delineate a stream buffer on the land area directly adjacent to the watercourse. The state's Policy Plan recommends a 100 foot buffer of forest or natural vegetation on each side of the river and its tributaries. Montgomery County is recommending a stream buffer width consistent with its stream buffer guidelines, as identified in Table 1. The stream buffer may be expanded to include any environmentally sensitive land features as described in Table 3. It is further recommended that a minimum of 50 feet of this buffer be forested. Afforestation will be necessary in stream buffer areas that do not meet this 50 foot forested minimum. The stream buffer area, based on the recommended widths in Table 1, will consist of approximately 1,257 to 2,515 acres, constituting approximately 7% to 14% of the PMA, or approximately 3% to 6% of the watershed.

The stream buffer area shall be left undisturbed and in its natural state. Land disturbing activities such as clearing and grading will not be permitted in the stream buffer area. Activities that would be encouraged in the stream buffer area include afforestation and, possibly, the implementation of Best Management Practices (BMPs). The control of noxious weed species-- Thistles (Asteraceae or compositae), Johnsongrass, shattercane and wildcane, multiflora rose--in the stream buffer area will be permitted when deemed necessary and when done in a manner that minimizes disturbance to other vegetation. Any disturbance of the stream buffer will require technical staff review.

The majority of the area along the Patuxent mainstem and a significant portion of the area adjacent to the Hawlings River mainstem which would be delineated as stream buffer are already included in existing and proposed parkland or WSSC property (Fig. 6).

(For a complete discussion of stream buffer requirements on agricultural land, refer to section D.3. Preserving Agricultural Land.)

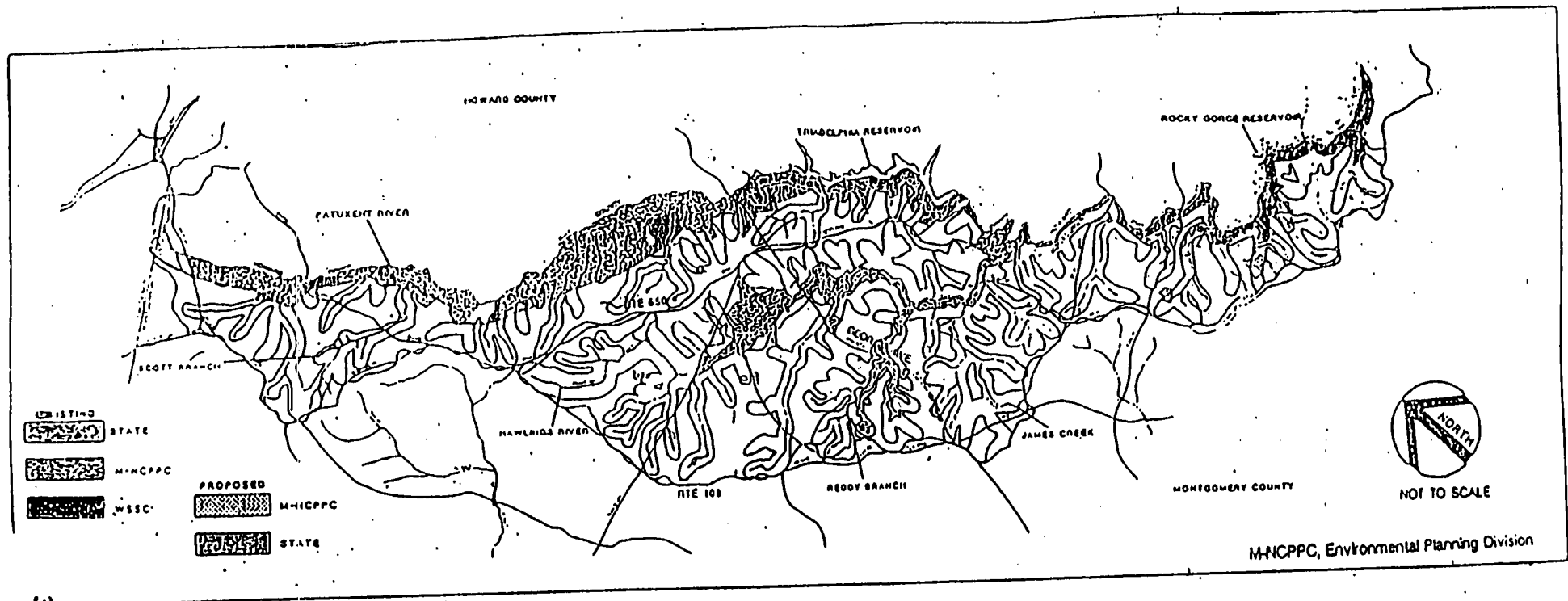
---

Table 3. Recommended Environmentally Sensitive Land Features to be included in the Stream Buffer Area:

1. the one-hundred year ultimate floodplain;
  2. all wetlands (and associated 25' buffers) adjacent to the stream or to the one-hundred year floodplain;
  3. slopes of twenty-five percent or greater abutting or adjoining the stream, the 100-yr. ultimate floodplain or stream side wetlands;
  4. specific areas of critical habitat for rare or sensitive wildlife and/or vegetation, as defined in COMAR, Title 08.03.08.
-

PUBLICLY OWNED LAND

PATUXENT & HAWLINGS RIVER WATERSHEDS



39

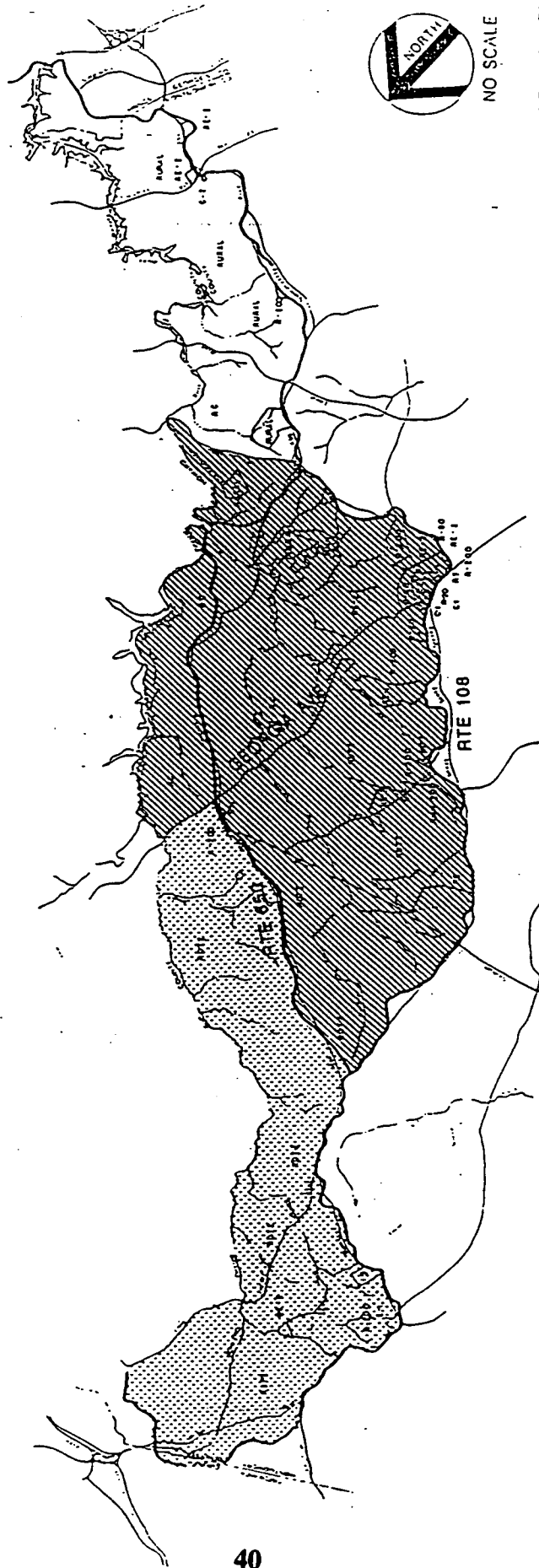
PRIMARY MANAGEMENT AREA  
APPROXIMATE DELINEATION



Fig. 6 Publicly Owned Land

# WATER USE CLASSES PATUXENT RIVER WATERSHED

Fig. 7



c. The Transition Area within the PMA

The land area remaining in the PMA that does not fall into the designated stream buffer will be managed as a transition area. Zoning densities of one unit per two acres or less will be recommended for the transition area. This would include RE-2, RE-2C, Rural, RC, and RDT zoning categories. Development will be accommodated in ways which minimize impacts on water quality and maximize the protection of existing environmental features. Overall imperviousness in each subdivision should not exceed 10%. The planning challenge within the transition area will be to resist the tendency toward fragmented suburban sprawl by consciously siting development to optimize existing infrastructure and soil infiltration capacities while minimizing impacts to environmentally sensitive land features. Agricultural activities will be permitted in the transition area (see section C. "Preserving Agricultural Land").

d. Existing Areas in Nonconformance with the PMA Guidelines

Properties for which the PMA guidelines are applicable (Table 2) but that have existing zoning densities greater than RE-2 will be subject to "nonconformance requirements". Nonconformance requirements consist of stormwater management and best management practices applied to the property which will minimize the impacts of higher density zones, particularly higher levels of imperviousness, on water quality. These requirements will also apply to RE-2C, RC and RDT zones where use of cluster development results in densities greater than one unit per two acres. The Planning Department staff is available to work with applicants to select the most effective BMP or combination of BMPs for the specific site. Table 4 describes some, but certainly not all, possible BMPs.

---

Table 4. Possible BMPs

1. Locating and possibly clustering development to maximize suitable developable land areas and to minimize impacts to water quality and other environmental considerations such as tree stands and wetlands.
2. Widening the stream buffer area to ensure increased infiltration of pollutants, nutrients and sediments over the extended run.
3. Afforestation of more than the required 50 foot minimum of forest cover within the stream buffer.
4. Utilizing more innovative and effective SWM. Maximize infiltration and design ponds to effectively mitigate for both temperature and nutrient/sediment removal. Design for the ten-year storm rather than the required two-year storm.

Also see Appendix E.

NOTE: Applicants may design and implement, upon staff and Planning Board approval, their own innovative BMP(s). The goal with this option is to foster and encourage a genuine effort between the county and developers to devise and implement effective, innovative and environmentally sensitive land management practices.

---

## 2. Providing BMPs

The provision of Best Management Practices in the Primary Management Area is required for all areas where zoning densities are higher than RE-2, as previously discussed. The use of BMPs will also be encouraged in lower density areas during the development review process to facilitate clustering of development and the maximization of soil infiltration capacities. Soil and water conservation plans utilizing BMPs are strongly encouraged on agricultural lands in the PMA, with the incentive of a reduction in the recommended stream buffer width on portions of properties submitted for subdivision and/or site plan review which will be used for agricultural purposes.

## 3. Preserving Agricultural Land

The preservation of prime and viable agricultural land is a goal of the Patuxent watershed primary management area as it is throughout upper Montgomery County. It is hoped that the designation of the Patuxent PMA will help achieve the delicate balance between development and agriculture while ensuring water quality.

As discussed earlier, these guidelines only apply to properties that are proposed for development (Table 2). Existing agricultural land will not be subject to these guidelines unless it is included in a development proposal application submitted to M-NCPPC.

In order to encourage the retention of agricultural uses on at least a portion of properties proposed for development, the stream buffer will be reduced from the buffer strip widths listed in Table 1, to 100 feet for land that remains in agriculture and has adopted a soil and water conservation plan approved by the Montgomery Soil Conservation District. However, depending on the site, the stream buffer may be extended to include environmentally sensitive land features (Table 3). It is also recommended that a minimum of 50 feet of the 100 foot stream buffer be forested. Agricultural activities utilizing BMPs are encouraged in the transition area of the PMA and the reduction of the stream buffer from that recommended in Table 1 to 100 feet is done in recognition that the maximization of available land is a necessity for a viable farm. The Planning Board may grant a variance to the PMA 100' stream buffer requirement on agricultural portions of plans when the applicant can demonstrate to the satisfaction of staff and the Planning Board that water quality would not be degraded by agricultural activities.

It must also be recognized that the intent of the Primary Management Area is to protect and restore water quality conditions in the Patuxent watershed. To this end, the infiltration and nutrient storage capabilities of forested buffer strips are considerable, as are the beneficial effects such a buffer strip would have on water temperatures and habitat. In order to preserve water quality and avoid the increased regulation that may occur if water quality continues to decline, the Montgomery Soil Conservation District is entreated and encouraged, not only to comply with the forested buffer strip recommendations made herein, which are based on studies conducted by and endorsed by the Cooperative Extension Service and the U.S. Fish and Wildlife Service, but also to re-examine the buffer strip requirements currently recommended by the USDA SCS (4 times the percent slope up to 99 ft.), in order to provide more

environmentally sensitive practices, particularly in special management areas such as the Patuxent River watershed.

The 100-foot recommended minimum buffer width is based upon literature reviews conducted by both the Department of Natural Resources and Department of State Planning. To be effective, buffer areas should be disturbed as little as possible, however, disturbance of the stream buffer for the purpose of controlling noxious weeds--Thistles(Asteraceae or compositae), Johnsongrass, shattercane and wildcane, multiflora rose--will be permitted when deemed necessary and when done in such a manner that the disturbance of other vegetation is minimized.

#### 4. Protecting Forest Cover/Re-establishing Forest Cover

In keeping with the state's March 1991 legislative mandate for local governments to develop and implement a Forest Conservation Program, the PMA will be targeted as a potential and logical location for preserving and/or re-establishing forest cover. The widespread benefits of forest cover on water quality include infiltration, sediment and nutrient storage and recycling, minimization of temperature impacts, reduction of wind speeds, providing an energy input into stream ecosystems and providing potential wildlife habitat.

The opportunity for reforesting a significant portion of publicly owned land in the Patuxent watershed PMA is great and should be maximized. Reforestation/afforestation will be strongly encouraged in the stream buffer area and in already developed and/or disturbed areas within the PMA. Preservation will always be recommended in the stream buffer areas, as well as in the transition area when and where there are large, beneficial and/or unique tree stands.

The implementation of Montgomery County's Forest Conservation Law and the need to designate potential tree receiving areas may provide the opportunity for developers to contribute to the reforestation/afforestation of buffers within agricultural areas as an off-site planting alternative. In addition, farmers may pursue incentive programs such as the State Conservation Reserve Program, the Maryland Agricultural Cost-Share Program, and the Green Shores Program in order to comply with the 50 foot forested buffer strip recommendation.

#### E. Septic Field Requirements within the PMA

County Executive Regulation 39-87 prohibits the location of sewage disposal systems within 300 feet measured horizontally from the normal high water level of a water supply reservoir or within 200 feet measured horizontally of the banks of a stream which feeds therein. The PMA policy plan recommends a minimum 300 foot septic setback for the Patuxent and Hawlings mainstems and a minimum 200 foot setback for all other watershed tributaries. Septic fields will not be permitted in the stream buffer. Any variance to the provision of septic fields within the transition area will be determined on a case by case basis.

A detailed technical study by the WSSC and/or the County Health Department on the health hazards associated with potential septic failures is strongly endorsed along with these PMA guidelines. The technical study should also provide recommendations pertaining to design, siting and minimum buffers required for septic fields.

## GLOSSARY OF TERMS

1. Afforestation - the creation, on a tract that is not presently in forest cover, of a biological community dominated by trees and other woody plants, at a density of at least 100 trees per acre with at least 50 percent of the trees having the capability of growing to a diameter, at 4.5 feet above the ground (diameter at breast height), of 2 inches or more within 7 years.
2. Conservation Easement - a restriction on the land and the natural features on this land. This easement is shown on the record plat and its terms and conditions are recorded in the county's land records. Most commonly, the agreement prohibits removal of healthy mature trees and shrubs, and changes to the scenic character of the land without written permission from M-NCPPC's Planning Department.
3. Diameter at breast height (DBH) - The diameter of a tree as measured at a height 4.5 feet from the ground.
4. Drainage Course - a natural or man-made drainage network having a defined channel which appears on either, M-NCPPC 200 foot scale topographical coverage, a developer's field topographic, or is located in the field.
5. Ephemeral Stream - a channel that has flow only in direct response to precipitation.
6. Erodibility coefficient (k factor) - value assigned to soil types by the USDA Soil Conservation Service which identifies the susceptibility to erosion based on topography and various soil characteristics.
- 7a. Floodplain - a relatively flat or low land area adjoining a river, stream, pond, stormwater management structure, or watercourse subject to periodic, partial or complete inundation; or an area subject to unusual and rapid accumulation or runoff of surface water as a result of an upstream dam failure.
- 7b. 100-YR Flood - a flood that has a one percent statistical probability of being equalled or exceeded in a given year (or that would occur on the average of once in every one-hundred years). Unless otherwise stated, this calculation is based on the contributing watershed being completely under existing zoning.
- 7c. 100-YR Floodplain - the area along a river, stream, pond, SWM structure, or watercourse that would be inundated by a 100-YR flood, based on ultimate development of the watershed under existing zoning.
8. Forest - a biological community dominated by trees and other woody plants covering a land area of 10,000 square feet or greater. Forest includes:
  - 1) areas that have at least 100 trees per acre with at least 50 percent of those trees having a 2 inch or greater diameter at breast height; and
  - 2) forest areas that have been cut but not cleared. Forest does not include orchards.

9. Forest Stand Delineation - a detailed summary of existing forest and trees on a site, prepared by identifying forest stands based on methodology detailed in the Trees Technical Manual. The information gathered in the forest stand delineation is overlaid with the natural resources inventory and becomes the basis for determining priority areas for forest and tree retention.
- 10a. Forest Conservation - the retention of existing forest or the creation of new forest at the levels prescribed by the Planning Board or the Planning Director.
- 10b. Forest Conservation Plan - outlines the strategies and specific plans proposed for retaining, protecting, and reforesting and/or afforesting areas on a site.
11. Hydraulically Adjacent Slopes - slopes lying within 200 feet (from bank) of a stream/drainage course, which drain directly to the stream/drainage course or its associated floodplain. When the stream buffer encompasses the toe of a steep slope within the 200 foot section, adjacency will apply to the entire slope even if the 200' cutoff is in the middle of the slope.
12. Hydraulically Remote Slopes - slopes lying beyond the area designated as the stream valley buffer of a stream/drainage course, or slopes lying beyond 200 feet (from bank) of a stream/drainage course if the stream buffer is less than 200', which may or may not drain directly to the stream/drainage course or its associated floodplain.
13. Intermittent Stream - a stream in which surface water and base flow is absent during a portion of the year.
14. Local Genetic Origin - refers to plants whose seed source is from an area within a 150-mile range of Montgomery County.
15. Native - Refers to a plant or animal species whose geographic range during pre-colonial times included the Piedmont of Maryland. Information on native plants can be found in Woody Plants of Maryland (Brown and Brown, 1972) and Herbaceous Plants of Maryland (Brown and Brown, 1984), as well as other literature sources.
16. Natural Resources Inventory - a complete analysis of existing natural features, forest and tree cover on site. The natural resources inventory (NRI) must cover the development site and first 100 feet of adjoining land around the perimeter or the width of adjoining lots, whichever is less. Natural features include topography; steep slopes; perennial and intermittent streams and major drainage courses; 100-yr floodplain; wetlands; soils and geologic conditions; critical habitats; aerial extent of forest and tree cover; cultural features and historic sites; necessary buffers.
17. Percent Slope -  $[(\text{Vertical Rise in feet}) / (\text{Horizontal Run in feet in the steepest 100 foot segment})] \times 100\%$ .  
Vertical rise in feet divided by horizontal run in feet in the steepest 100 foot segment, multiplied by 100 percent.
18. Perennial Stream - a stream which has base flow all year.

19. Preliminary subdivision plan - A plan subject to the review and approval procedures of Chapter 50, "Subdivision" of the Montgomery County Code.
20. Primary Management Area (PMA) - An area within the Patuxent watershed critical to the Chesapeake Bay which may be included in plans and zoning ordinances. Preferred land uses in the PMA will be agriculture, forest, and recreation. State and local governments will ensure that land use practices within the PMA shall be of such a nature so as to have no (or minimal) adverse impact on water quality of the Patuxent River.
21. Reforestation - the creation of a biological community dominated by trees and other woody plants containing at least 100 trees per acre with at least 50 percent of those trees having the potential of attaining a 2 inch or greater diameter at breast height within 7 years.
22. River Outwash Savanna - A plant community formed on extensive deposits of the Potomac and dominated by grasses, with hardwoods (often oaks) interspersed. River outwash savannas often provide habitat for many of Maryland's uncommon and State listed (by DNR) plant species.
23. Serpentine Barren - A plant community underlain by serpentine soils (rich in chromium and magnesium and poor in essential plant nutrients) and dominated by grasses, often with pines interspersed. Serpentine barrens often provide habitat for many of Maryland's uncommon and State listed (by DNR) plant species.
24. Shale Barren - A plant community occurring on Triassic red shale outcrops and often containing uncommon and State listed (by DNR) plant species.
25. Shrub - A woody plant, usually with multiple stems, each of which has a dbh (diameter at breast height) of less than three inches. Shrubs are generally less than 20 feet tall at maturity.
26. Site plan - A plan subject to the review and approval procedures of Chapter 59, "Zoning," Division 59-D-3, "Site Plan" of the Montgomery County Code.
27. Specimen tree - a tree that is a particularly impressive or unusual example of a species due to its size, shape, age, or any other trait that epitomizes the character of the species.
28. Steep slope - a slope in which the percent slope equals or exceeds 25 percent.
29. Stream buffer - an undisturbed strip of natural vegetation contiguous with and parallel to the bank of a perennial or intermittent stream, which may be designed to:
  - \* protect hydraulically adjacent slope areas;
  - \* maintain or improve the water temperature regimen/water quality of the stream(s);
  - \* protect natural wetlands;
  - \* provide groundwater storage/recharge for a stream;

- \* complement regulations pertaining to the 100-year ultimate floodplain;
  - \* provide wildlife habitat, open space, or both; and
  - \* complement on-site erosion/sediment control measures by serving as a back-up natural filter/trap.
30. Tree - a large, woody plant having one or several self-supporting stems or trunks and numerous branches that reach a height of at least 20 feet at maturity.
31. Water Uses -

The Maryland Department of the Environment applies distinct designated water uses for the surface waters of the state, each having a specific set of standards. The designated water uses and their standards are:

**A. USE I: WATER CONTACT RECREATION & PROTECTION OF AQUATIC LIFE**

Waters which are suitable for: water contact sports; play and leisure time activities where the human body may come in direct contact with the surface water; fishing; the growth and propagation of fish (other than trout); other aquatic life, and wildlife; agricultural water supply; and industrial water supply.

Criteria for Use I waters:

- a) Bacteriological - there may not be any source of pathogenic or harmful organisms in sufficient quantities to constitute a public health hazard. Public health hazard will be presumed when:
  - (i) fecal coliform density exceeds a log mean of 200 per 100 ml based on minimum of 5 samples taken over 30 days;
  - (ii) 10 percent of total number of samples exceed 400 per 100 ml; or
  - (iii) except when a sanitary survey approved by the Maryland Department of the Environment discloses no significant health hazard, i and ii do not apply.
- b) Dissolved Oxygen - may not be less than 5.0 mg/liter at any time.
- c) Temperature - maximum temperature outside the mixing zone may not exceed 90 degrees F (32 degrees C) or the ambient temperature of the surface waters, whichever is greater. A thermal barrier which adversely affects aquatic life may not be established.
- d) pH - Normal pH values may not be less than 6.5 or greater than 8.5.
- e) Turbidity - may not exceed levels detrimental to aquatic life. Turbidity in the surface water resulting from any discharge may not exceed 150 units at any time or 50 units as a monthly average.
- f) Toxic Substances - all toxic substance criteria to protect fresh water and estuarine and salt water aquatic organisms, and the wholesomeness of fish for human consumption, apply in fresh, estuarine and salt waters (see COMAR 26.08.02.03-3).

**B. USE I-P: WATER CONTACT RECREATION, PROTECTION OF AQUATIC LIFE, AND PUBLIC WATER SUPPLY**

Waters which are suited for all uses identified in Use I and use as a public water supply.

Criteria for Use I-P waters:

- a) The criteria for Use I waters (a)-(e)
- b) Toxic Substances - all toxic substances criteria for protection of fresh water aquatic organisms and to protect public water supplies and the wholesomeness of fish for human consumption apply.

**C. USE II: SHELLFISH HARVESTING WATERS**

None in Montgomery County

**D. USE III: NATURAL TROUT WATERS**

Waters which are suitable for the growth and propagation of trout, and which are capable of supporting self sustaining trout populations and their associated food organisms.

Criteria for Use III waters:

- a) Bacteriological - same as Use I waters
- b) Dissolved Oxygen - may not be less than 5.0 mg/liter at any time with a minimum daily average of not less than 6.0 mg/liter.
- c) Temperature - maximum temperature outside the mixing zone may not exceed 68 degrees F (20 degrees C) or the ambient temperature of the surface water, whichever is greater. A thermal barrier that adversely affects aquatic life may not be established.
- d) pH - same as Use I waters
- e) Turbidity - same as Use I waters
- f) Total Residual Chlorine (TRC) - except as provided in COMAR 26.08.03.06, the Department may not issue a permit allowing the use of chlorine or chlorine compounds in the treatment of wastewater discharging to Use III and III-P waters.
- g) Toxic Substances - all criteria to protect fresh water aquatic organisms and the wholesomeness of fish for human consumption apply.

**E. USE III-P: NATURAL TROUT WATERS AND PUBLIC WATER SUPPLY**

Waters which include all uses identified for Use III waters and use as a public water supply.

Criteria for Use III-P waters:

- a) The criteria for Use III waters (a)-(f)
- b) Toxic Substances - all toxic substances criteria for protection of fresh water aquatic organisms and to protect public water supplies and the wholesomeness of fish for human consumption apply.

## **F. USE IV: RECREATIONAL TROUT WATERS**

Waters which are capable of holding or supporting adult trout for put and take fishing, and which are managed as a special fishery by periodic stocking and seasonal catching (cold or warm waters).

Criteria for Use IV waters:

- a) Bacteriological - same as Use I waters
- b) Dissolved Oxygen - same as Use I waters
- c) Temperature - maximum temperature outside the mixing zone may not exceed 75 degrees F (23 degrees C) or the ambient temperature of the surface water, which ever is greater. A thermal barrier that adversely affects aquatic life may not be established.
- d) pH - same as Use I waters
- e) Turbidity - same as Use I waters
- f) Toxic Substances - all toxic substance criteria to protect fresh water aquatic organisms and the wholesomeness of fish for human consumption apply.

## **G. USE IV-P: RECREATIONAL TROUT WATERS AND PUBLIC WATER SUPPLY**

Waters which include all uses identified for Use IV waters and use as a public water supply.

Criteria for Use IV-P waters:

- a) The criteria for Use IV waters (a)-(e)
- b) Toxic Substances - all toxic substances criteria for protection of fresh water aquatic organisms and to protect public water supplies and the wholesomeness of fish for human consumption apply.

### **COMAR 26.08.02.04 Anti-Degradation Policy**

A. Certain waters of this state possess an existing quality which is better than the water quality standards established for them. The quality of these waters shall be maintained unless:

- (1) The Department determines a change is justifiable as a result of necessary economic or social development; and
- (2) A change will not diminish uses made of, or presently possible, in these waters.

B. To accomplish the objective of maintaining existing water quality:

- (1) New and existing point sources shall achieve the highest applicable statutory and regulatory effluent requirements; and
- (2) Nonpoint sources shall achieve all cost effective and reasonable best management practices for nonpoint source control.

- C. The Department shall discourage the downgrading of any stream from a designated use with more stringent criteria to one with less stringent criteria. Downgrading may only be considered if:
- (1) The designated use is not attainable because of natural causes;
  - (2) The designated use is not attainable because of irretrievable man-induced conditions;
  - or
  - (3) Controls more stringent than the effluent limitations and national performance standards mandated by the Federal Act, and required by the Department, would result in substantial and widespread economic and social impact.
- D. The Department shall provide public notice and opportunity for a public hearing on the proposed change before:
- (1) Permitting a change in high quality waters; or
  - (2) Downgrading any stream use designation.
- E. Water which does not meet the standards established for it shall be improved to meet the standards.
32. Wetland - an area that is inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically adapted for life in saturated soil conditions, commonly known as hydrophytic vegetation.

## APPENDIX A

### REQUIREMENTS FOR FLOODPLAIN DELINEATION

For detailed floodplain studies, an applicant is required to use step-back water calculations to determine water surface profiles. Representative cross sections shall be taken at each significant change in the regimen of the stream (i.e., change in slope, channel width, or stream roughness). Normal depth computations are acceptable for approximate floodplain studies.

Where appropriate, applicants shall use a starting water surface elevation and a cross-section taken from M-NCPPC studies downstream of the subject property. In situations where upstream analysis by private engineers has been approved, this information may be considered as input to analysis of downstream properties under supercritical flow regimes. Sufficient cross-sections shall be included between the existing study and the subject property to maintain accuracy of backwater calculations.

The ultimate one hundred year flood event discharge may be determined by using any of the following:

- a. TR-55;
- b. TR-20;
- c. HEC-1;
- d. Rational Method (in special cases only, determined on a case-by-case basis).

Other methods, such as HSPF, HSPX, R-ROUTE, UROS, shall be used only for conducting watershed studies.

The hydraulic computations to determine water surface elevations shall be performed using either of the following models:

HEC-2 (preferred)  
WSP-2

Four cross sections will be taken at each structural crossing, such as bridges or culverts, as follows:

- 1. A distance upstream of the crossing equal to the width of the structural opening;
- 2. At the upstream face of the crossing;
- 3. At the downstream face of the crossing; and
- 4. A distance downstream of the structure equal to four times the width of structural opening.

Appropriate values of Manning's "n" will be determined (see watershed studies) for use in modeling.

For HEC-2 use, recommended expansion and contraction coefficients are as follows:

	<u>Expansion</u>	<u>Contraction</u>
Gradual Transitions	0.3	0.1
Bridge and Culvert Sections	0.5	0.3
Abrupt Channel Transitions	0.8	0.6

Calculations and/or computer printout must be provided for staff's review, as well as a map showing floodplain delineation and cross-section locations.

## APPENDIX B

### ERODIBLE SOILS LIST

(Source: U.S. Department of Agriculture, Soil Conservation Service (SCS), 1990 Interim Soil Survey and Montgomery County, Maryland Update 1985-1992 - Highly Erodible Land Report)

The following soils are classified as highly erodible land by the SCS, based on the erodibility index of a soil map unit. These soils are severely erodible and should be incorporated into the property's open space and carefully managed during construction.

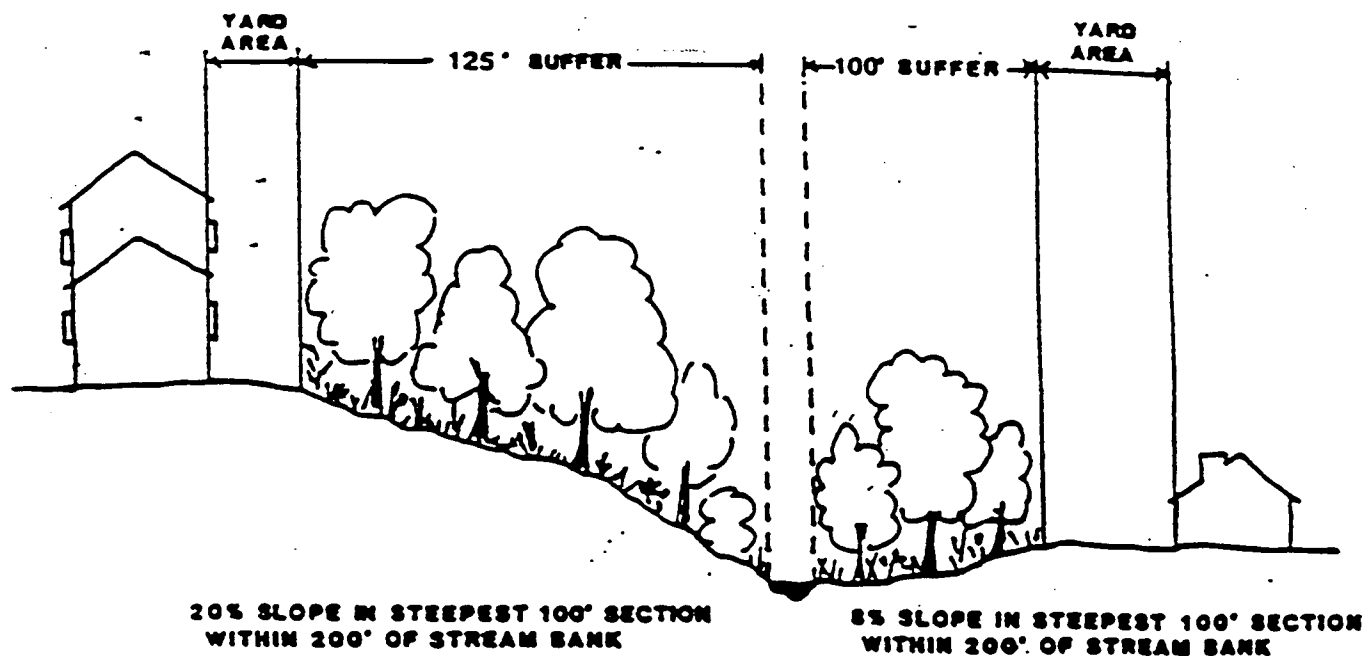
- 1C Gaila silt loam, 8 to 15% slopes
- 2C Glenelg silt loam, 8 to 15% slopes
- 4C Eliok silt loam, 8 to 15% slopes
- 9C Linganore-Hyattstown channery silt loams, 8 to 15% slopes
- 16C Brinklow-Blocktown channery silt loams, 8 to 15% slopes
- 16D Brinklow-Blocktown channery silt loams, 15 to 25% slopes
- 17C Occoquan loam, 8 to 15% slopes
- 18C Penn silt loam, 8 to 15% slopes, very stony
- 18E Penn silt loam, 15 to 45% slopes, very stony
- 20C Brentsville sandy loam, 8 to 15% slopes
- 21C Penn silt loam, 8 to 15% slopes
- 21D Penn silt loam, 15 to 25% slopes
- 21E Penn silt loam, 25 to 45% slopes
- 21F Nestoria-Rock Outcrop Complex, 25 to 50% slopes
- 24D Montalto silt loam, 15 to 25% slopes, very stony
- 25C Legore silt loam, 8 to 15% slopes
- 26C Montalto silt loam, 8 to 15% slopes
- 27C Neshaminy silt loam, 8 to 15% slopes
- 35C Chrome silt loam, 8 to 15% slopes
- 57C Chillum silt loam, 8 to 15% slopes
- 57D Chillum silt loam, 15 to 25% slopes
- 58C Sassafra loam, 8 to 15% slopes
- 61C Croom gravelly loam, 8 to 15% slopes
- 61D Croom gravelly loam, 15 to 25% slopes
- 61E Cromm gravelly loam, 25 to 40% slopes
- 64C Croom and Bucks soils 8 to 15% slopes
- 65B Wheaton silt loam, 0 to 8% slopes
- 109D Hyattstown channery silt loam, 15 to 25% slopes, very rocky
- 109E Hyattstown channery silt loam, 25 to 45% slopes, very rocky
- 116D Blocktown channery silt loam, 15 to 25% slopes, very rocky
- 116E Blocktown channery silt loam, 25 to 45% slopes, very rocky

(Note: The change in soils considered highly erodible is based on the use of new, more modern field methods for determining the physical properties of soils, and the regrouping and/or renaming of soils to reflect similarities in physical properties based on the new field methods. The erodible soils list is taken directly from information provided by the SCS.)

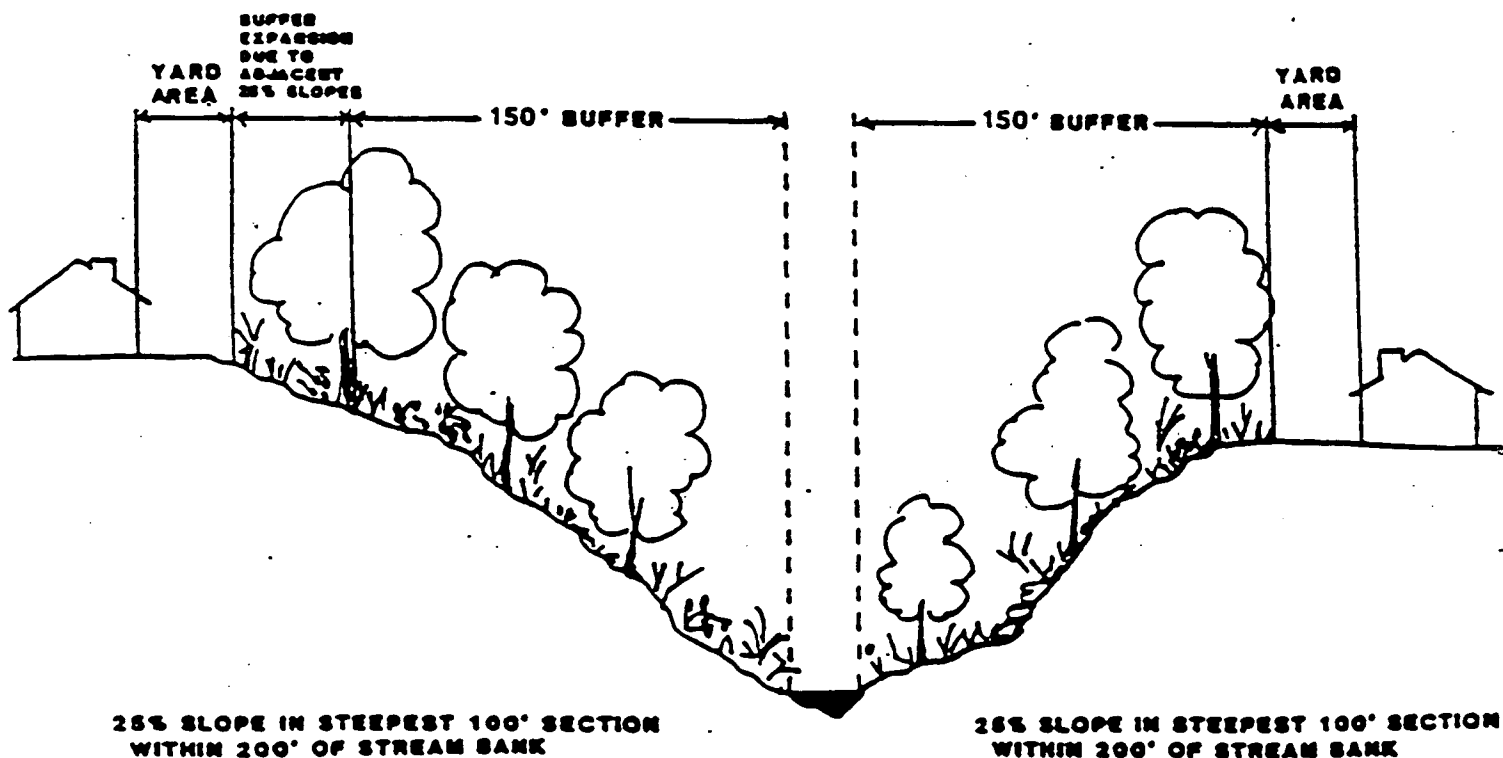
## APPENDIX C

### HYPOTHETICAL SUBDIVISIONS SHOWING STREAM BUFFER DELINEATIONS

#### STREAM BUFFER DELINEATION FOR A USE I/I-P STREAM



#### EXPANDED STREAM BUFFER DELINEATION FOR A USE I/I-P STREAM



**APPENDIX D**  
**STATE WATER USE DESIGNATIONS FOR**  
**MONTGOMERY COUNTY STREAMS**

<u>Use</u>	<u>Waters</u>	<u>Limits</u>
Use I	(*) Little Paint Branch Sligo Creek Rock Creek	Below MD Route 28
Use I-P	(*) Patuxent River and all tributaries except those designated below as Use III-P or IV-P	Upstream of Rocky Gorge Dam
	(*) Potomac River and all tributaries except those designated as Use III, III-P, IV or IV-P	
	(*) Little Seneca Creek and Little Seneca Lake	Between the lake and the B&O Railroad Bridge and below confluence of Bucklodge Branch including Bucklodge Branch
	(*) Little Monocacy River	
	(*) Bennett Creek	
	(*) Great Seneca Creek	
	(*) Dry Seneca Creek	
	(*) Cabin Branch	Above confluence with Little Seneca Lake
	(*) Ten Mile Creek	Above confluence with Little Seneca Lake
Use II	None	
Use III	(*) Paint Branch and all tributaries	Upstream of Capital Beltway (I-495)
	(*) Rock Creek and all tributaries	Upstream of Muncaster Mill Road
	(*) North Branch Rock Creek and all tributaries	Upstream of Muncaster Mill Road
Use III-P	(*) Little Bennett Creek and all tributaries	Upstream of Maryland Route 355
	(*) Furnace Branch and all tributaries	
	(*) Patuxent River and all tributaries	Upstream of Triadelphia Reservoir
	(*) Little Seneca Creek and all tributaries	Downstream of Little Seneca Lake between the B&O Railroad Bridge & the confluence with Bucklodge Branch
	(*) Wildcat Branch	Upstream of Great Seneca Creek




March 1994

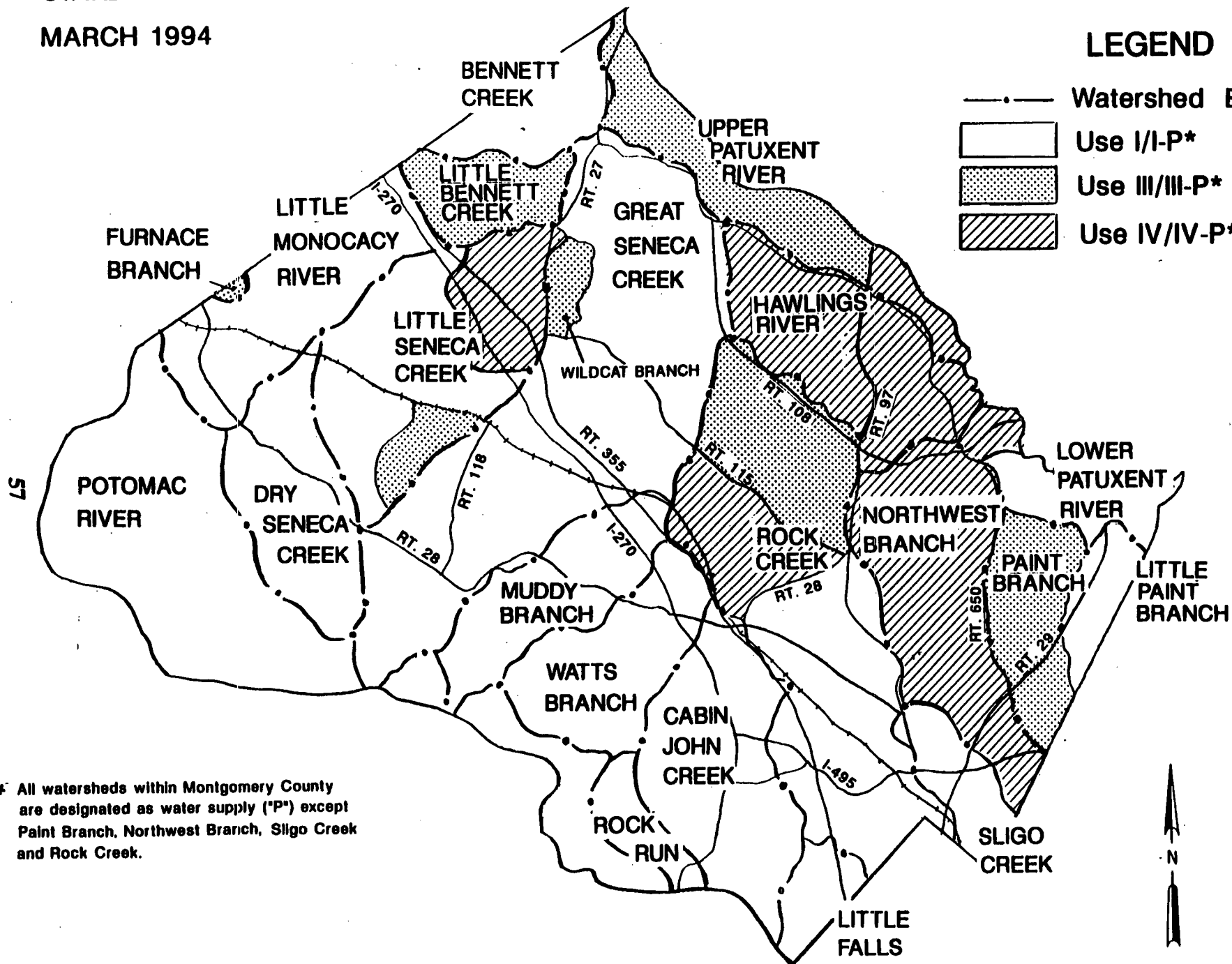
Use IV	(*)	Rock Creek and all tributaries	From Route 28 to Muncaster Mill Road
	(*)	Northwest Branch & all tributaries	Upstream of East-West Highway (MD Route 410)
Use IV-P	(*)	Patuxent River and all tributaries	Between Rocky Gorge and Triadelphia Reservoirs, and including Triadelphia Reservoir
	(*)	Little Seneca Creek & all tributaries	Above confluence with Little Seneca Lake

# STATE WATER USE DESIGNATIONS FOR MONTGOMERY COUNTY STREAMS

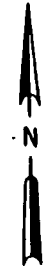
MARCH 1994

## LEGEND

- Watershed Boundary
-  Use I/I-P\*
-  Use III/III-P\*
-  Use IV/IV-P\*



\* All watersheds within Montgomery County are designated as water supply ("P") except Paint Branch, Northwest Branch, Sligo Creek and Rock Creek.



## APPENDIX E

### BEST MANAGEMENT PRACTICES

As required under, and to conform to applicable county and state laws and regulations, the applicant shall identify best management practices (BMPs) to reduce sediment and pollutant loading in receiving streams. Additional BMPs may be recommended on a case-by-case basis in coordination with MCDEP. The BMPs shall be incorporated into the Stormwater Management Concept Plan required with the preliminary plan submission. Some possible BMPs are as follows:

- \* To maximize the potential use and success of infiltration techniques, buildings, parking lots and other impervious development should be located on soils with a low infiltration capacity, to the extent feasible. Pervious soils should be maintained as open space, conservation easements, parkland or stormwater facility sites to the greatest extent consistent with other land use and zoning objectives. Parking lots should not be located within the stream buffer or 100-year ultimate floodplain.
- \* When a development site consists of both cropland and forest, it is preferable to develop the area of cropland.
- \* Road and public utility stream crossings and stream buffer encroachments should be minimized. Where stream crossings and buffer encroachments must occur, they should be placed away from environmentally sensitive areas, and combined to minimize disruption in the stream valley. Clear bridge spans should be used to cross water courses whenever possible, particularly in Use III/III-P and IV/IV-P watersheds. Culverts may be permitted on a case-by-case basis if it can be demonstrated that the benefits would outweigh any negative impacts. Culvert inverts should be located at least one foot below invert of the stream to allow fish passage. Bottomless culverts should be utilized in all instances practicable.
- \* Sewer mains and pumping stations should be sited and constructed in such a manner as to protect ground and surface waters. Sewer lines and pumping stations should be located as far as practical (minimum of 50 feet where possible) from streams while still maintaining needed elevations and gradients to provide reliable service.
- \* Whenever possible, natural drainage systems should be utilized instead of hydraulically efficient structural drainage. No modification of existing natural drainage should occur except for bank stabilization, swales, habitat improvement measures, and unavoidable infrastructure improvements (roads, sewer lines, stormwater management, etc.). Non structural methods such as grass swales and stream stabilization which conforms to the stream dynamics are preferred over structural measures such as concrete channels or typical rip-rap projects.
- \* To the extent feasible, natural drainage ways and stormwater basins should be shaded in Use III/III-P and IV/IV-P streams to prevent high temperature stormwater from being discharged into receiving streams.

- \* Headwater areas are more sensitive to land use changes and should be protected by buffering and minimizing impervious surfaces in order to maintain stream base flow and control temperatures.
- \* Additional sediment and erosion control measures may be recommended by M-NCPPC staff in consultation with DEP, where slopes exceed 15 percent and the soils are highly erodible (Appendix B), or where environmentally sensitive features warranting extraordinary controls have been identified.
- \* Use of porous materials is encouraged in large parking areas to limit impervious surface, particularly in areas of occasional use.

## APPENDIX F

### PERFORMANCE MONITORING

The Planning Board supports long term, continuous monitoring of streams. However, the proposed performance monitoring will be limited to a period ranging between 18-24 months, or more if required by the state. Its primary purpose is to evaluate responses of tributary streams to proposed land uses, BMPs and actual construction practices.

The monitoring program could be biological, chemical, ecological, and/or physical. In case of physical or chemical monitoring, selected parameters and criteria would be targeted towards the determination that existing state water quality goals/standards are being met. The monitoring results will also be used to evaluate baseline data on existing water quality, estimate the likely impact of development on water quality, and assess actual impact on water quality during construction and at project completion. Results will be used to evaluate the effectiveness of stormwater management controls and BMPs.

Monitoring data shall be reported to the M-NCPPC Environmental Planning Division. If during the construction period, on the basis of monitoring results, it is determined that state's water quality standards are not being met and failure to meet these standards can be attributed to the monitored development, staff would meet with the applicant to determine what other steps could be mutually agreed upon to ensure compliance with state water quality standards, in consultation with the Maryland Department of the Environment.

Performance monitoring and reporting may be required of the applicant or applicant's agent at the direction of the Planning Board to ensure that existing water quality is maintained during and after development activity. The monitoring results will be used to collect baseline data on existing water quality, estimate the likely impact of development on water quality, and assess actual impact on water quality during construction and at project completion. Results will also be used to evaluate the effectiveness of stormwater management controls and BMPs. Monitoring data shall be reported to the M-NCPPC Environmental Planning Division. The scope, location and timing of monitoring and reporting is provided below. The Board may at its discretion waive or add other requirements to the scope.

- \* The applicant (or the M-NCPPC with applicant funding) shall provide grab samples every month with field measurements of flow, pH, temperature, and dissolved oxygen; and laboratory analyses of major pollutant constituents as specified by prior agreement in the approval of preliminary/site plans. Quarterly reports shall be provided to the M-NCPPC Environmental Planning Division, the Montgomery County Department of Environmental Protection, and the Maryland Department of the Environment.
- \* For projects constructed in Use III/III-P and IV/IV-P watersheds, monitoring and reporting shall begin at least three months prior to initiation of grading and continue for a period of 18-24 months after the development is completed, (to include 2 summers for critical water quality information.)
- \* Monitoring and reporting will be conducted in a manner to provide needed data on best management practices. A minimum of three stations will be sampled during each sampling

session. At the discretion of M-NCPPC, this may involve either 1) sampling upstream, downstream, and within a particular BMP to evaluate its performance effectiveness; or 2) monitoring upstream of the development site, within the development site, and downstream of the development site to assess the relative pollutant contribution to the affected stream system. At least eight of the samples must be collected during storm flow resulting from rainfall events. If the site is not directly on a stream, sampling stations will be chosen in relation to key storm drain outfall points. This program may be modified to require automated monitoring. In-lake monitoring may also be required where applicable.

- \* The applicant may be required to conduct biological and stream habitat monitoring in combination with physical/chemical monitoring. Biological monitoring shall be conducted for aquatic macroinvertebrates to determine the overall impact of development on the stream system (indicator organisms can provide information about the quality of a stream system). Bio-assay testing shall be conducted prior to grading, during construction and after completion of the development project. Scheduling of testing during construction shall be determined as part of the subdivision/site plan approval.
- \* The analysis shall be conducted at the applicant's expense and in coordination with the M-NCPPC. The applicant will be responsible for selecting a state certified analytical laboratory and for using EPA standard field sample collection methods for physical and chemical water quality parameters and EPA rapid bioassessment techniques for biological and habitat monitoring.
- \* Performance monitoring requirements and results will be periodically reviewed by the county's interagency Water Resources Planning Group, comprised of representatives from DEP, the M-NCPPC, WSSC, the MSCD and a representative from the environmental and development communities. The committee may make periodic suggestions to the Planning Board concerning the efficiency of these performance monitoring requirements and any recommended changes. [The Planning Department will recommend a water quality monitoring protocol suitable for use in the development review process.]

## APPENDIX G

### ENVIRONMENTALLY SENSITIVE OR SPECIAL PROTECTION AREAS WHICH REQUIRE DETAILED PROJECT REVIEW

The following projects may be subject to more stringent environmental management measures as outlined in Section V when they are public projects, or when they occur on public lands. The need for these measures will be determined when such a project is submitted for Mandatory Referral review.

- \* New impoundments of one billion or more gallons of water.
- \* Commercial, industrial, and institutional development handling large amounts of hazardous substances on a regular basis (e.g., hospitals, private landfills, gasoline stations, and horticultural nurseries).
- \* Any water supply project involving the development of 5 million gallons per day or more safe yield.
- \* Any project or contract which would increase existing water or sewer service to the county by 20% or more.
- \* Any project using 100,000 gallons per day or more of water from a community water supply.
- \* Construction of a new state highway of any dimension, or construction of any other new public road which is four lanes or more in width or 2 miles or more in length.
- \* The expansion or modification of a public road which
  - a) increases the design capacity of such road 50% or more beyond its previously existing design capacity, or
  - b) involves earth disturbance of 5 or more acres per mile.
- \* The addition of one or more interchanges to a completed limited access highway.
- \* Construction of any new rapid transit line on a new right-of way; extension or abandonment of an existing rapid transit line.
- \* Construction of a major new air passenger or air cargo terminal or new airfield runway; extension of an existing runway.
- \* A tank for any flammable fluid with a capacity of 100,000 gallons or more.
- \* Construction of a new pipeline for the transportation of water, natural gas, petroleum, or sewage of 10 miles or more in length; construction of any new submarine pipeline of 1 mile or more in length.
- \* New electrical generation units capable of producing 100 mW or more.

- \* New nuclear electrical generating units, evacuation plans for such new units, storage sites for nuclear waste from or reprocessed fuel for such units, and nuclear fuel reprocessing facilities.
- \* Electrical transmission lines of 230 kV and above of which 5 miles or more are located on new, previously unutilized, or expanded right-of-way.
- \* New fossil fuel utilization facility or fuel conversion to coal of an existing facility having an energy input capacity of 500 million BTUs per hour or more.
- \* Site for treatment or disposal of hazardous material off the site of generation or release.  
Site for disposal of radioactive material.

## APPENDIX H

The following recommendations are taken from the state Patuxent River Policy Plan (1984).

### RECOMMENDATIONS

#### 1. ESTABLISHING A PRIMARY MANAGEMENT AREA (PMA)

A PRIMARY MANAGEMENT AREA, DELINEATING THE AREA ALONG THE RIVER AND ITS TRIBUTARIES, WILL BE ESTABLISHED TO IDENTIFY AND MANAGE LAND FROM WHICH POLLUTION IS MOST LIKELY TO BE TRANSPORTED INTO THE RIVER.

The PMA shall be considered to be an area critical to the Chesapeake Bay and its tributaries;

Local governments will include the PMA in their plans and zoning ordinances;

Preferred land uses in the PMA will be agriculture, forest, and recreation;

Local governments will prepare plans for the PMA to minimize dense and intensive development and large impervious areas in the PMA;

State agencies, in regulatory activities, technical assistance, and grant programs, will target the PMA as a priority area; and

State and local governments will ensure that land use practices within the PMA shall be of such a nature so as to have no (or at least minimal) adverse impact on water quality of the Patuxent River.

#### 2. PROVIDING BEST MANAGEMENT PRACTICES (BMPS) AND VEGETATIVE BUFFERS

PROGRAMS FOR PROVIDING BMPS AND VEGETATIVE BUFFERS IMMEDIATELY ADJACENT TO THE RIVER AND ITS TRIBUTARIES WILL BE DEVELOPED.

State and local governments will provide BMPs on their publicly owned lands, including buffers where appropriate;

The State will require BMPs on State assisted projects, including buffers where appropriate;

Local governments will adopt subdivision and zoning provisions that require BMPs, including buffers where appropriate, in all new development;

BMPs, including filter strips and field borders, will be encouraged on agricultural land through education, voluntary action, incentive, compensation, and through implementation of the Maryland Agricultural Water Quality Management Plan;

Implementation of soil conservation plans, including filter strips and field borders where appropriate, will be required on lands acquired in easements;

The federal government will be requested to provide BMPs including buffers where appropriate, on its lands; and

The State Department of Transportation will protect roadside buffers by eliminating its practice of broadcast spraying of herbicides along roadsides.

### **3. IDENTIFYING MAJOR NONPOINT POLLUTION SITES**

THE STATE, IN CONJUNCTION WITH LOCAL GOVERNMENTS, WILL SURVEY THE WATERSHED AND IDENTIFY MAJOR NONPOINT POLLUTION SITES.

Existing State regulatory and corrective programs will consider these sites as priority areas.

### **4. RETROFITTING EXISTING DEVELOPMENT**

THE STATE WILL DEVELOP A COST-SHARING PROGRAM TO AID LOCAL GOVERNMENTS IN CORRECTING AND MANAGING STORM WATER POLLUTION FROM EXISTING DEVELOPED AREAS.

Local governments will pursue a program of abating pollution in existing developed areas;

State and local governments will curtail nonpoint pollution coming from their facilities; and

The State will establish priorities among developed areas causing nonpoint pollution and address problems in order of priority.

### **5. ACCOMMODATING FUTURE DEVELOPMENT**

FUTURE DEVELOPMENT WILL BE ACCOMMODATED IN WAYS TO MINIMIZE IMPACT ON WATER QUALITY AND MAXIMIZE EXISTING OPPORTUNITIES.

Development will be concentrated where possible, outside the PMA;

Development will optimize the use of existing facilities and utilities;

Development will be sited to maximize use of soil infiltration capacity;

Development will be sited away from sensitive areas, such as reservoirs, wetlands, steep slopes, and aquifer recharge areas;

Sites within the watershed that offer unique opportunities for development and redevelopment will be identified and planned; and

New public facilities (schools, parks, highways) will incorporate best management practices.

### **6. INCREASING RECREATION AND OPEN SPACE**

**ADDITIONAL RECREATION AND OPEN SPACE LANDS WILL BE ACQUIRED IN THE PATUXENT WATERSHED BY THE STATE AND LOCAL GOVERNMENTS.**

State and local governments will review their recreation and open space plans for the Patuxent Watershed;

Acquisition will be concentrated along the river and tributaries and in the lower portion of the watershed;

Federal holdings in the watershed must be retained for open space and research; and

An acquisition program for the lower portion of the watershed will be prepared.

**7. PROTECTING FOREST COVER**

**EXISTING FOREST COVER WILL BE RETAINED AND IMPORTANT SENSITIVE AREAS WILL BE REFORESTED TO PROTECT WATER QUALITY.**

Existing State programs, like Program Open Space and Agricultural Preservation will be examined and amended for their application to forest protection;

Buffering with forested strips will be encouraged; and

The State will institute a reforestation program for developed areas.

**8. PRESERVING AGRICULTURAL LAND**

**PRIME AND PRODUCTIVE AGRICULTURAL LAND WILL BE PRESERVED IN THE PATUXENT WATERSHED**

Easement purchases will include requirements for implementing soil conservation plans including buffer strips where appropriate; and

The Agricultural Cost-Sharing program will target the Patuxent watershed.

**9. EXTRACTING SAND AND GRAVEL**

**SAND AND GRAVEL ACTIVITIES WILL BE MANAGED TO ALLOW EXTRACTION OF THE RESOURCE WITHOUT DAMAGE TO THE RIVER.**

Abandoned sand and gravel sites will be reclaimed;

Sensitive control of active and future sites, particularly those in the PMA, will be required;

Penalties for allowing sediment to enter the Patuxent River resulting from washing operations are to be increased to a minimum of \$1,000 per day for every day a violation is found to exist by the appropriate state agency; and

The location of the resources will be identified, and county resource management strategies developed.

#### **10. ADOPTING AN ANNUAL ACTION PROGRAM**

**THE PATUXENT RIVER COMMISSION WILL ANNUALLY DEVELOP AND ADOPT AN ACTION PROGRAM TO IMPLEMENT THE STRATEGIES.**

The action program will contain a schedule and indicate responsibilities in carrying out specific actions to implement the plan;

A community education program will be an integral part of the action program; and

The Commission will prepare an annual report on progress in implementing the plan.

The recommendations and proposed actions in this plan are a starting point. The Policy Plan has been approved by county governments and the General Assembly. Approval of the plan indicates concurrence and commitment to improving the Patuxent River. The combined work of local and State governments, citizens, land owners, and private industry is required to transform the proposals into an improved river.

While prepared for the Patuxent, the land management recommendations contained in this plan can serve as a model for managing any watershed and the Chesapeake Bay.

## REFERENCES

- 1) American Society of Planning Officials. Planning Advisory Service Report Nos. 307,308. Performance Controls for Sensitive Lands. A Practical Guide for Local Administrators, July 1975.
- 2) Brown, R.G. and M.L. Brown. 1972. Woody Plants of Maryland. Port City Press: Baltimore.
- 3) ---- 1984. Herbaceous Plants of Maryland. Port City Press: Baltimore.
- 4) Chester County Water Resources Authority. The Brandywine Plan. A plan for the Upper East Branch of Brandywine Creek West, Chester, Pa. 1968.
- 5) COMAR 08.05.04. National Wetlands. December 1989.
- 6) Cowardin, L.M. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Dept. of the Interior, Fish and Wildlife Service. Washington, D.C.
- 7) Davis, W. J. 1978. Sediment Basin Trap Efficiency Study, Montgomery County, Maryland. Paper No. 78-2564 American Society of Agricultural Engineers, pp. 14-27.
- 8) Doyle, R. C., D. C. Wolfe, and D. F. Bezdicek, 1974. Effectiveness of forest buffer strips in improving the water quality of manure polluted runoff. In Proceedings of 3rd. International Symposium on Livestock Wastes, American Society of Engineers, pp. 299-302.
- 9) Franks, E.C. and J.W. Reeves. 1988. A Formula for Assessing the Ecological Value of Trees. Journal of Arboriculture 14 (10).
- 10) International Society of Arboriculture. 1988. Valuation of Landscape Trees, Shrubs, and Other Plants. seventh ed. Official Publ. of the International Society of Arboriculture.
- 11) Karr, J.R., and I.J. Schlasser, 1977. Impact of near stream vegetation and stream morphology on water quality and stream biota. EePA-600/3-77-097. U.S. Environmental Protection Agency, Athens, Georgia, 91 pp.
- 12) Klein, Richard D. 1979. Urbanization and Stream Quality Impairment. Water Resources Bulletin, vol 15, no. 4. American Water Resources Association. pp.948-963.
- 13) Lynch, J.A., E.S. Corbett, and W.E. Sopper, 1980. Evaluation of management practices on the biological and chemical characteristics of stream flow from forested watersheds. Institute for Research on Land and Water Resources, Pennsylvania State University, pp.6-11.
- 14) Maryland Department of Health and Mental Hygiene. Draft Patuxent River Basin 208 Plan. September, 1982.
- 15) Maryland Ornithological Society. 1982. Maryland and D.C. Breeding Bird Atlas Project Handbook, 1983-1987. Supplement to Maryland Birdlife, Vol.38, 1982.